



Computer Weekly



Thursday, June 2, 1983

Japanese in lead with 256K chips

by Kevin Cahill
JAPANESE micro companies are set to dominate the market for the latest and largest chips. The 256K dynamic random access memory (DRAM) market is already open for volume delivery by at least two Japanese companies - Fujitsu and Oki Data - with maybe two other companies, namely Hitachi and Mitsubishi, offering near production level volumes now.

This implies that the Japanese are going to repeat their near 70% domination of the 64K DRAM market, which they achieved by early entry, and that they will lose little along the way to American companies, none of which is in 256K production yet.

According to Nigel Williams of component vendor Mshattan Skyline, there is currently widespread availability of 256K DRAM chips in the marketplace. His company acts as UK and European agent for Oki Data and Williams says that Oki will formally announce in Japan in September that it has immediate availability of 256K DRAMs. He predicts a simultaneous announcement in the US and deliveries in volume in Europe by next December or January. However, Oki US has already run an advertisement offering "larger than 64K memory devices" in the US.

Fujitsu, widely noted as the leading supplier in the current early 256K DRAM market, showed a production model 16-bit personal computer at the NCC two weeks ago, with a single 256K chip as the main memory.

A number of Japanese micro makers, including Sord, were offered volume availability of 256K chips as long ago as March by Fujitsu.

And Hitachi, which was the first Japanese company to disclose specific delivery plans for 256K chips, has been quietly delivering volume samples into the UK for the past three months.

Informed sources say that preferred customers have been getting the samples since last September.

The opening price is thought to be in the \$30 to \$50 range and the reason that the Japanese have been so reluctant to come out in the open has been the fear of reprisals from an openly hostile US semiconductor industry which spent much of last year accusing the Japanese of dumping 64K DRAMs, and calling for US government sanctions against leading Japanese manufacturers.

The relative willingness by the Japanese to acknowledge the position recently has stemmed from aggressive American advertising particularly from AT&T, saying that the company had 256K DRAMs available.



LOUTH... Blowing away the customer's anxiety.

Tandem launches fibre optic link for NonStop

By Philip Hunter
TANDEM Computers, the world leader in fault-tolerant hardware, has added another dimension to its "no-die" philosophy by launching a fibre optic link for its NonStop computers. The link, called Fox, consists of four individual cables each capable of transmitting one Mbyte per second, which is 300 times what can be achieved with standard dual 56K communication lines. Louth says this will make it feasible for large mainframe users to distribute big databases to local processors in individual departments.

Systems connected by Fox can also be linked up to Tandem's Expand network.

Louth says the high-speed link effectively adds a new dimension to the fault-tolerant concept of continuous computing by enabling the hardware to be spread across a number of sites.

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Watch out for a d.i.y. computer

by Philip Hunter
A REWARD of £4,500 is being offered for the return of computer equipment worth £45,000 stolen last month from a firm in the Cotswolds. Police are baffled by the crime in which thieves broke into the Way Garden City factory of the Computer Supplies and went out with enough video tapes, printers, processors, disk drives and cabinets to build two complete minicomputers.

"We have no leads at all," says Chief Inspector Smith of the CID. Anyone offered a minicomputer for £20,000 that is not previously made by a well-known company should be examined carefully, says Smith - it might be made of the stolen bits.

The stolen parts bear the name of either Amida itself, or its supplier Digico. The equipment made by several companies, including Transnet and Insignia, Smith points out that the might well have been changed now.

The loss of the equipment first noticed as staff arrived work on the morning of May 9. "The apparent entry by getting on to the roof and using the Perspex skylight."

The usual inquiries have been made, says Smith, including interrogation of all Amida members. It is possible, he suggests, that someone went for Amida and was involved, perhaps supplying the necessary technical information.

Amida would not comment on the matter, but says that it is a commercial matter.

Improve or close, Inmos warns

by Kevin Cahill
IMPROVE productivity or we close the factory is the stark warning given to Inmos staff at its Newport site.

The threat of closure in such specific terms was denied by Inmos management, but a spokesman admitted that this was made or break year at Newport.

The allegations that the company had made a threat of closure were put by local Plaid Cymru member Phyllis Cox, and appeared in the South Wales Argus last week.

Cox said that the management had made the statement to the workers at a gathering in the works canteen about three weeks ago.

Despite the denials by management Cox stuck to her story, and her agent John Morris said that they had investigated and their sources were reliable.

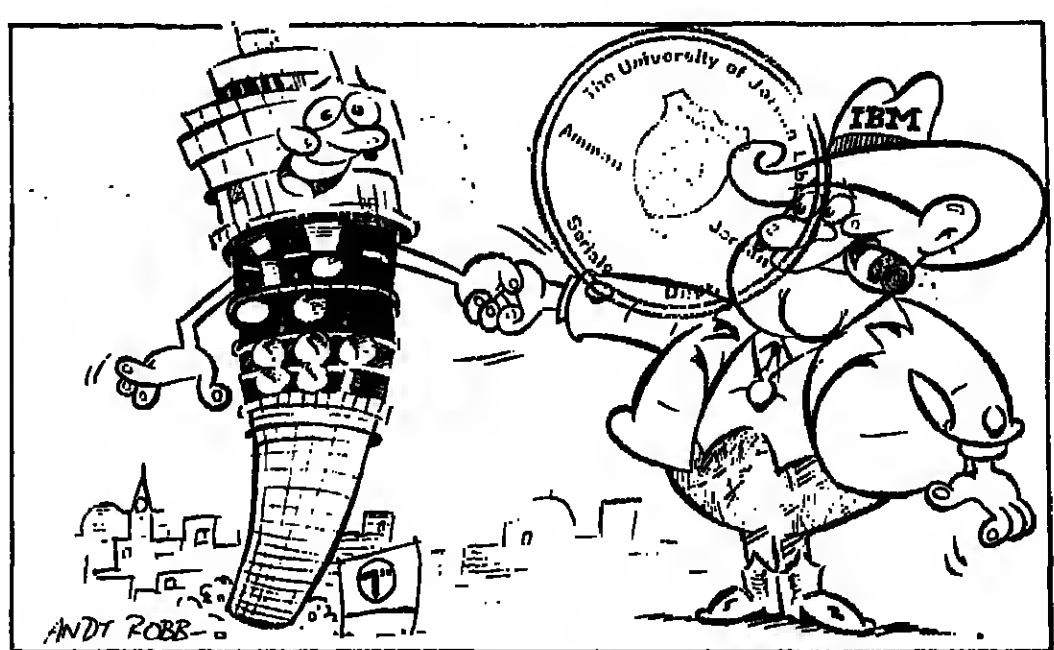
Inmos holds regular meetings with all its staff and a meeting did take place three weeks ago at which the role of the Newport factory was spelt out. This included a clear indication that unless Newport met the targets set for it the factory would not be viable by the end of the year.

The warning comes as the number of people at Newport passed 300, with a total of 500 staff targeted for the end of the year.

Sales in the first quarter of the year at Inmos were \$5 million, compared with total sales last year of £13.7 million.

Last year, however, Inmos lost £20 million and had to receive an emergency loan of £15 million from the British Technology Group in January.

"The loan was meant to tide the company over a temporary cash crisis while the new chairman Malcolm Wilcox sought private finance for the group."



IBM set to manage BT networks

by Ron Coates
IBM IS poised to make one of its biggest ever deals and take over the management of British Telecom's DP network services.

The company is assembling a management team in Warwick and is carrying out trials with Telecom on site in Bristol with a major IBM customer, Phoenix Assurance.

Last month Telecom rushed through the installation of two special lines for the trials. IBM is also negotiating with a major UK telecom supplier, Racal Milgo, for some of the technology and equipment for Telecom's proposed rival service to the Mercury consortium.

A Telecom spokesman said that he was "neither in a position to confirm or deny" the deal. And he added: "Telecom is in discussions with all sorts of organisations about possible services for its customers."

The move appears to be an end to IBM's long search for a telecommunications partner to help it counter the threat from US giant AT & T which has cleared the last court hurdles in the US to allow it to compete in the DP market.

Tories may revamp ExportIT

THE rebirth of the ExportIT computing experts scheme with much-expanded funding is expected to be an early priority if a Conservative government is elected today (Thursday).

A full-time chairman has been chosen and the appointment simply awaits a stamp of approval from the new information technology minister or equivalent. Extra staff will be taken on to supplement the five full-time people involved in the pilot scheme.

NCC chairman

PROFESSOR John Ashworth next month takes over from Jim Merriman as chairman of the National Computing Centre. Ashworth, 44, is vice chancellor of Salford University, and was chief scientist for the government's think tank between 1976 and 1981. Merriman has been chairman of the centre since 1977, and has been a consistent supporter of better operating standards for information technology.

Ferranti sale

FERRANTI has announced the first sale of its sophisticated microprocessor based CEDREC energy management system to Eastern Europe. TESLA industries at Brno in Czechoslovakia have ordered CEDREC to help cope with preset energy supply levels which incur penalties if exceeded. And the Peoples Republic of China has just taken delivery of a fourth Quest Q design CAD system for PCB manufacture. The system based on Quest's Q 1600 16 bit minicomputer, is worth £90,000 and will be used by the Shanghai Instrument Research Institute.

Health fears delay RT plans

Health fears have delayed plans to restrict the use of VDUs to four hours a day with a 10 minute break every hour.

A spokesman for UCUW appeared dismayed at the outcome of the vote: "It's early days for the system, and there's no evidence that VDUs cause health problems," he said.

Despite UCUW officials arguing that the present microfilm system used for directory enquiries at the conference had earlier

Eurolink MD saves child cancer investigation

by Andrew Thomas
A CANCER research project involving over 300 children in 15 countries has been saved by a Brighton software house. The project, aimed at investigating ways of treating brain tumours in children, was threatened with closure because of cutbacks in the National Health Service. But a £6,000 loan from Tony Antonides, managing director of Eurolink Computer Services, means the work can continue.

The project is co-ordinated from the Royal Marsden Hospital in London, one of the world's leading cancer hospitals. Antonides, responsible for the scheme and its financial problems when his mother was dying from a brain tumour earlier this year.

"The care and treatment given to my mother was truly remarkable," says Antonides. "When I heard that this important cancer research project was in danger, I knew I must take action to support it. I feel my action is a special memorial to my mother, and I am sure that this work will save children's lives."

The study is assessing a new way of treating highly malignant me-

Bishops' blessing for DEC's new Irish plant

By John Kavanagh
TWO bishops and the Irish Prime Minister Dr. Garret Fitzgerald opened Digital Equipment's 150,000-sq ft factory in Clonmel, County Tipperary, last Friday.

The plant, employing 200 people, is three times bigger than the nearby factory it is replacing. And the Irish Republic's Industrial Development Authority announced that DEC was to invest a further £9 million in expanding its software operation in Galway and re-organising its factory there.

The US minicomputer leader is one of the biggest of the 800-plus foreign companies based in the Republic in terms of employees and the biggest in terms of output. It has a simple assembly and testing plant. Its second factory, in Clonmel, was opened in 1978 and its plants now build computers, communications products and power supplies in the Republic and employ 1,300 staff there.

Clonmel plant manager Ed O'Connell said the company was impressed by the quality, especially the conscientiousness of the local staff. "They have consistently helped to meet all delivery dates and maintain highest quality and cost-performance standards," he said.

The plant was opened by Fitzgerald and blessed by the Bishop of Waterford and Lismore, Michael Russell, and the Bishop of Cabel and Ossory, Noel Willoughby. The blessing of new factories is a normal practice in the Republic. Ireland is DEC's main manufacturing centre outside the US.



at the package.

R & H drops three operations

WELLINGBOROUGH-based R & H Systems has opted out of two US distribution deals and hired out a third. Graphics terminal manufacturer R & H set up its own UK R & H staff in new Northampton head, and Vector General will account for a further three when it starts operation in Woking later this month.

Of the remaining 20 R & H employees 11 are now working for the UK arm of Applied Dynamics, in the same building as what remains of R & H. Both R & H and US-based Applied Dynamics are owned by the Dutch holding company International Miller.

ADI general manager Peter Wright said that the firm is now to develop R & H into a CAD consultancy company.

CP/M originator eyes IBM patch

by Claire Gooding
CP/M ORIGINATOR Digital Research is moving into native IBM territory, until now held by arch-rival Microsoft. Digital Research's plan is to release its entire range of languages to run under PC-DOS, the native operating system of the IBM Personal Computer supplied by Microsoft. The languages - and by implication the applications which already exist under the CP/M family - will be released during June and July.

This will make it possible for users to recompile applications written for CP/M, still the richest source of packages, to run directly under PC-DOS. Previously anyone wanting to run CP/M applications had to invest in Digital Research's 16-bit alternative to PC-DOS, CP/M-86. Digital Research is supplying PL/I for the first time on the PC, and Pascal MT+, Logo, Micro Focus Cobol, and its own Personal Basic and C compilers in direct competition to the Pascal, Fortran, Micro Focus Co-

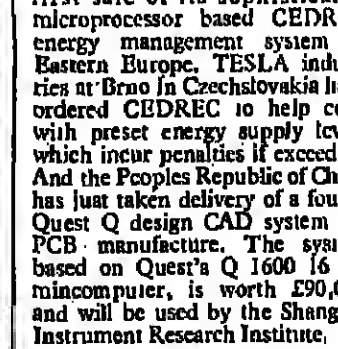
bol, MBasic, Lattice C compiler, and graphics-oriented GT Basic supplied by Microsoft.

Microsoft is interpreting Digital Research's move as a victory rather than an invasion. "It's a significant turnaround of viewpoint," said Microsoft's UK managing director David Fraser. "It knocks a sizeable nail in the coffin of CP/M-86. We're highly honoured that they're implementing their languages under our operating system, but they've missed the boat. IBM takes its languages from us and there's no reason, with Microsoft's pedigree, why people should buy from another stable."

Digital Research refuses to be drawn on Microsoft's charge that PC-DOS and MS-DOS now reign supreme and CP/M-86 has given up all claim to be "standard".

"I'm not sure that anything's going to dominate," said Digital Research's UK managing director Paul Bailey. "It doesn't matter."

Continued on page 3



BAILEY... Not sure.

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Was Dover seizure a fraud?

by George Black
and Kevin Cahill

COMPUTER systems seized at Dover docks would have been unlikely to have given the Eastern bloc any secrets.

Customs officials are holding two DEC Vax11/780s which had been labelled as "typesetting equipment" and bound for the East. But a spokesman for DEC said it was unlikely that the technology was in any way secret and had been distributed through third parties to Iron Curtain countries for some time.

He pointed out that typesetting was now wholly computer-based, so that even the fraud inquiry could turn out to be a "red" herring.

Media allies of the US defence department have been quick to claim that the incident gives credibility to the Pentagon's campaign for a clampdown on sensitive export.

a new export law, is under pressure to grant the Pentagon power of veto on sales of computer systems abroad.

And at the NATO Co-ordinating Committee for Export Controls (COCCOM) the American assistant secretary for international security policy Richard Parle has been seeking to persuade West European governments to put tighter curbs on systems with military significance.

But British officials have been resisting. They believe the Reagan administration is bullying its supporters into line and maximise its own economic advantage.

Unimpressed by the Williamsbury summit declaration supporting free trade, ministers of 12 NATO countries last week issued a communiqué demanding a bigger share of defence contracts for European suppliers.

Current estimates of the US-Europe defence trade balance vary from 7-1 to 15-1.

HP workers get share of \$49m profit

HEWLETT-PACKARD distributed \$400,000 to its UK employees and nearly 1 million worldwide in its new profit-sharing payout. Its earnings were up 16% to \$1.1 billion on sales which increased 13% to \$2.2 billion.

Of the company's \$9,000 employees, 62,500 were eligible to share in the payout through a plan which has been in place for six months or more.

Unix-Zilog link

AT&T, the American phone company, has done a deal with Zilog, a company similar to those recently made by three other big chip-makers, Intel, Motorola and National Semiconductor. The agreement means AT&T will adapt its Unix operating system software to match the latest generation of Zilog chips.

Case for teletext

CASE has announced its plan of providing support for the international communications word processing protocol, a UK-made MSX range of machines by the end of the year.

Branching out

UK BANKING systems specialist BIS Software has branched out into insurance packages by buying BIS Insurance Systems. It will be its Folio package on IBM PCs. The new firm has 21 staff, headed by Simon Orme, managing director of Lonsdale Systems. Orme has "very ambitious" plans for growth through product development and takeovers. Canadian-owned Lonsdale is a target? "I have no comment. We are old friends," he said.

African arm

FOLLOWING its appointment as exclusive UK and South Africa distributor for ICL, Miki's accounting software, Systems has set up a subsidiary in Johannesburg, near Johannesburg, to become a major supplier of packages and turnkey systems to the market of rapidly growing businesses suffering from severe shortages of competent managers and DP professionals.

Hearing delayed

THE latest date for the first hearing in the District Court of Northern California on the dispute between Plessey and Rolm has been put back to July 25. The dispute has been changed several times as Plessey spokesmen said that out-of-court settlement will be extremely unlikely. Plessey has accused Rolm of using the technology covered by its recently-expired agreement to use its IDL digital telephone exchanges. Plessey, a counter-accused Rolm of trying to keep it out of the US market illegally.



FORTUNE... Defence will give Ada credibility.

Case carries off a surprise £1.72 million profit

by Kevin Cahill
HEMEL Hempstead-based telecommunications and computer company Case took the City by surprise last week with sparkling results.

For the half year to March 31 1983 the company had a turnover of £14.59 million and profits of £1.72 million.

According to Case managing director Peter Burton sales for the period rose by 80%, with exports, mostly to the US, rising 2.7 times.

The company is listed on the UK Stock Exchange and caused some concern, reflected in a fallen share price, when it pulled out of a word processing deal with US-based NBI last year.

The pullout cost Case a £750,000 trading loss in the first half of the year though much of this was recovered in cash when NBI bought back shares and other items.

Brokers who panicked when the NBI pullout was announced are now looking ruefully at a share price of 250p, a 25% jump on the results.

For the full year (15 months)



BURTON... Sales up 80%.

CASE, who claim to be the UK's only major independent producers of data communications equipment, are showing turnover of £29.3 million compared with £17.4 million for the twelve months ended December 31 1981.

Industry analysts are now forecasting profits in the region of £3 to £3.5 million for Case's current year and Paradise, which distributes Case equipment in the US, is estimating sales of up to \$20 million for Case equipment alone.

Digital eyes IBM territory

From page 1

what they say - there's money to be made out there to the tune of \$12 million and we want a slice of it.

"It's true that a lot of languages branded by IBM come from Microsoft, but to the long run IBM won't tie itself. It wants co-operation from as many vendors as it can get. Why should we restrict our languages to the CP/M environment when IBM has opened up such a large market?"

Bailey admitted that his company might implement on the PC-DOS sister OS MS-DOS if it were likely to be lucrative - "but it isn't such a big opportunity."

Bailey points to the superiority of Digital Research language implementations as an attraction for the growing sector of professional DP users. The other main attraction is that independent software vendors - ISVs - will be able to bring products into the PC-native environment without going through the expensive development cycle.

There's such a choice of languages that it's difficult for some

ISVs to get the right target in sight," said Bailey.

Although Bailey points to several superior features of its versions of Pascal, and can offer Logo and PL/I beyond Microsoft's range, the main competition is likely to centre around the various versions of Basic.

"There are a lot of applications written in Basic," explained Bailey. "It doesn't have graphics or other vital commercial features. Because of our philosophy of total portability we'll now be able to transfer all those applications. We believe G-Basic is the best language for high-performance applications development and it will now be available to PC users."

Microsoft maintains that its own Business Basic and GW Basic are more than sufficient, and says that it already doing the job of offering PC "translations" which run more efficiently and much faster under Microsoft's own compilers. "We've got a lot of features in our GW Basic, such as graphics and sort keys. The two products G-Basic and GW Basic simply won't compete," said a Microsoft spokesman.

Rolm compiler is Ada favourite

by George Black

THE Rolm Ada compiler, now midway through the 1,700 program suite prescribed by the US defence department, looks likely to become the first true Ada compiler to be accepted by the Ada Joint Program Office. In April New York University's Ada translator was validated.

Rolm and its partner Data General claim this shows they have a lead of a year to 18 months over their rivals. But this was at once contested by Intel vice-president Bill Lartin, who said: "We could have been first to achieve validation, but we felt there were more important things for us to be doing in the commercial field."

Telsoft vice-president Bruce Sherman said in San Diego, California, that they had been shipping Ada compilers using ANSI 83 syntax and producing Motorola 68000 native code for the past

month. But he admitted they had not yet reached 100% implementation on the 68000. Telsoft hopes to submit 68000 and Vax-hosted versions to AJPO for validation by the end of the year.

Strong competition will come from a bunch of firms including Softech, Intermetrics, Irvine Computer Sciences and Western Digital.

Meanwhile Rolm and DG say they have an order for their Ada work centre from a military customer in France and another from a UK university. Their system combines Rolm's Ada development environment with DG's 32-bit Eclipse superminis. Target machines are the Eclipse or Rolm-Milspec.

Data General vice-president Ray Fortune said defence would be the area which gave Ada credibility. And they plan a drive to sell to universities, to create the grass-

root expertise needed. Coupled with this will be a campaign to convince large firms such as British Steel and British Telecom, previously wedded to older languages like Coral, to switch to Ada.

The DoD estimates it will save \$24 billion by the end of the century through Ada and has laid down it must be used for all new systems from January 1985.

But a prominent critic, Oxford University's Professor Tony Hoare, is still sceptical.

"My timescale predictions are coming true," he said. "I am sure it will be a standard, but it will take a very long time for people to learn how to use it reliably."

Most Pascal programmers would use a subset, guided by a small number of "Ada lawyers", he said. The danger was they would trip up when using Ada's other features.

Intel a jump ahead in race to link PCs to mainframes

by George Black

INTEL is ready to leapfrog others in the race to link up IBM Personal Computers to mainframes.

Foot runner MSA has five sites for its Peachlink system in the US, including Caesar's Palace in Atlantic City, and MSA director Stuart Walsh expects four British installations within two months. The firm has just run a one-day seminar for potential customers in London.

But Intel has crept up on MSA, with the first delivery of its iDAS 86/735 system this week.

Intel made a low-key announcement last October of its intention to make the system available in the first quarter of 1983, but that date came and went.

Now Intel is vying into the market with its adaptation of the System 2000 database management software linking micros to central files.

Products by Cullinet, McCormack and Dodge, Informatics and others are expected to follow.

IBM lowers 308X price

by Howard Karten

IBM recently dropped the US price of add-on 308X memory from \$25,000 to \$20,000 per megabyte. The move has left several observers here puzzled, since IBM apparently faces little competition in the add-on memory business which would lead it to offer a more competitive price.

In addition, since a typical 308X system price is in the neighbourhood of \$3 million to \$4 million, the price cuts are a minuscule percentage of the overall price.

The company has also lowered the price for maintenance.

Mitel shuts down US factory

by Kevin Cahill

MITTEL, the ambitious Canadian telecommunications company which is suffering severe delays with its key exchange, has closed a factory in the US.

The factory at Burlington in Massachusetts was opened just two years ago, and was intended to supply Mitel's growing private exchange market in the US, including IBM.

The factory closure comes at a time when Mitel has encountered a nine-month delay in the delivery of its DRX 2000 main PABX due to software problems.

IBM, which has a deal with Mitel for the supply of PABXs, is currently writing the software for the DRX but this is not expected to be ready before December, by which time Mitel and its distributors, including ICL, are expected to have lost ground to competitors, including Plessey.

The delays to the DRX 2000 and other problems encountered by Mitel have led to a severe decline in the company's share price.

Poll will be an IT bonanza

by Philip Hunter

TONIGHT'S election broadcasts will be emblazoned with a bonanza of colour graphics and computer predictions, the like of which have never been seen on our two major television channels.

BBC's presenter Peter Snow will be able to punch out graphics, bar charts, flowcharts and maps giving the political colour of selected constituencies on his own terminal.

"I shall be operating the computer live on air and we shall actually see it calculating the ups and downs of the vote on our screen in colourful animated pictures," Snow enthuses.

ITV boasts similar graphics. In fact the facilities available on both channels bear a strong resemblance to each other, with Digital Equipment Vax computers crunching through the predictions

in each case. And both channels are making the results available on their respective teletext services.

Here there is a slight difference, with BBC's Ceeffix organising the results alphabetically, while ITV's Oracle viewdata service will arrange the results in local groups filling a page each.

Another difference is that BBC's prediction software has been written by its own programmers, while ITV has employed Autofile of Slough to produce a results package.

The calculations are much more complicated this time, with three major parties rather than two, explains Autofile managing director Bob McPherson.

Autofile's software bases the predictions on 76 parameters, including country of constituency, coming down to the region, and

the economic group for example mining or rural.

Consideration is also taken of how marginal the seat was last time, boundary changes, and whether a well-known personality, either local or national, is standing.

AGB Cable and Viewdata has also been involved in election coverage with Granada Television during the campaign. Over 500 viewers have been issuing their opinions to Philips Vise viewdata terminals during a series of programmes shown on Channel 4. The studio presenter had access to the results in under two minutes.

Visitors to the Commodore Show at London's Curzon Hotel and tomorrow will not be denied television election coverage. A six foot monitor will bring them the predictions.

Legal wrangle costs UCL £100,000

by John Kavanagh

SYSTEMS house Universal Computers faces a legal bill estimated at over £100,000 by US manufacturer Microdata, which last month won its costs from its High Court action against the UK firm.

At the same time Universal Computers agreed to accept injunctions stopping it from defrauding or conspiring to defraud Microdata, using or disclosing confidential information and inducing Microdata customers to break their contracts.

The action was started by Microdata's UK subsidiary in 1980

under its name at that time, CMC. The action arose after Universal Computers won an order from ship broker Eggar Forester after Microdata claimed it already had a contract from the company.

Microdata has alleged Universal Computers used information gathered by the UK firm's directors, Nick Drescher and Alan Wilson, while they were Microdata employees.

Also involved are Consultants (Computer and Financial), which helped Eggar Forester with financing its order, and Patrick Staggs, a

former Universal Computers employee.

In March this year the defendants offered £67,000 to settle the wrangle. At the same time they agreed to temporary injunctions, saying they were not guilty of any of Microdata's charges so the injunctions made no difference to their business. But Microdata pursued the case to get its costs.

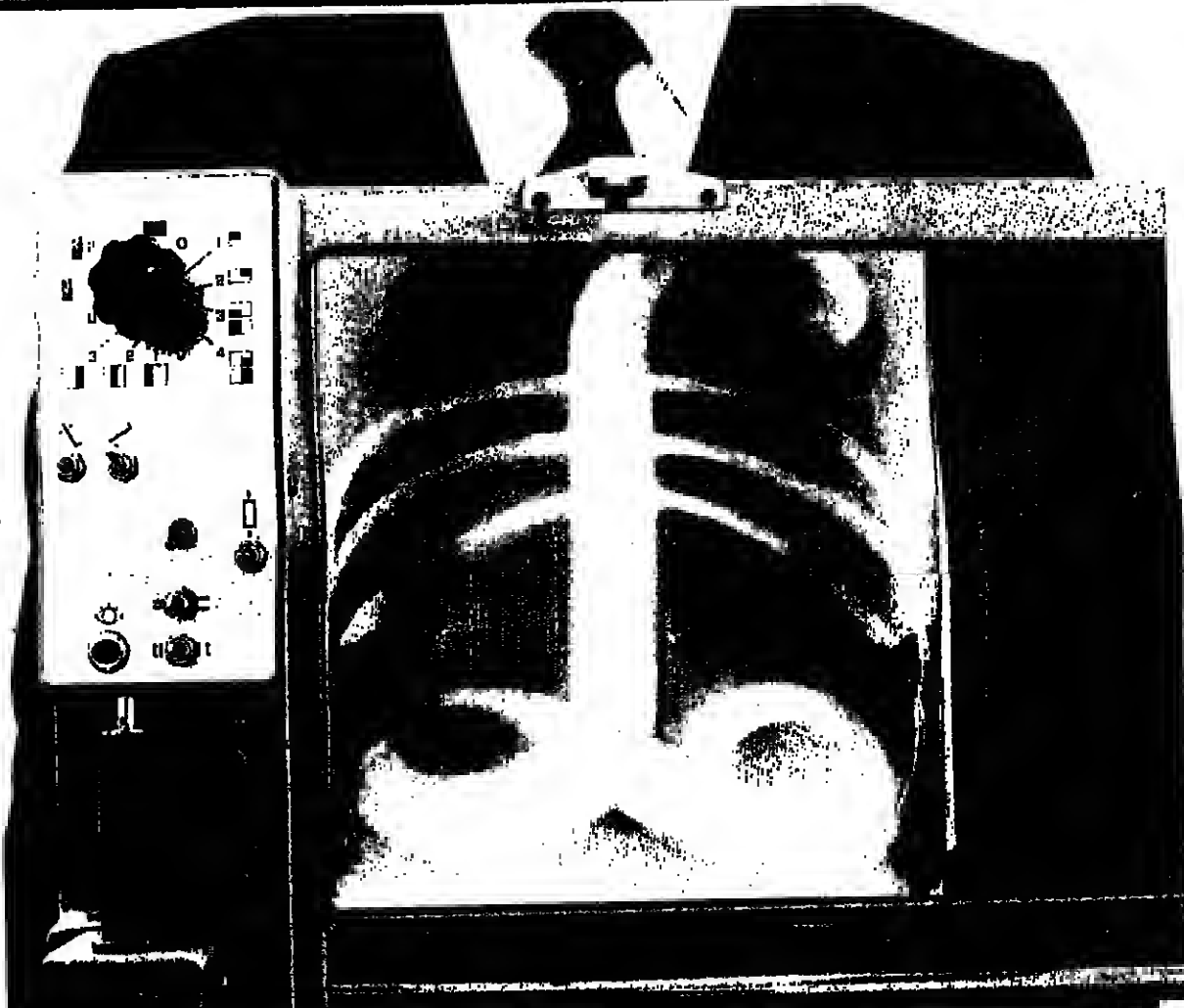
Last month Sir Robert Megarry granted Microdata three-quarters of its costs and the defendants accepted the injunctions as permanent.

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Sperry beats IBM and goes hunting

SPERRY this week set its sights on new customers with a new, cheaper mid-range mainframe. At the same time it announced that it had beat IBM to scoop a \$433 million US Navy deal.

The latest contract takes Sperry's sales to the US military well over the billion dollar mark for this year. Two months ago the company took a \$500 million order from the US Navy and earlier this year it pulled off a \$475 million order from the US Air Force.

The 15 model strong 1100/70 family is based on the 1100/60 but packs in four times the memory in the same space for a power range starting at 42 mips for the 1100/71 to 2.8 mips for the top end dual processor 1100/72. Prices range from an entry level £125,000 to what the company describes as £1 million plus.

John Pascoe, UK marketing director, said: "This machine is aimed at new customers. It will be a lower entry cost than the 60 and a lower entry cost for Mapper."

Mapper (Maintaining, Preparing and Producing Executive Reports) is Sperry's major software hope. The plain language file and report generating system is already bringing in more revenue than any other Sperry software product and is responsible for more new business.

Dun Bught, UK 1100 series product manager, said: "Previously we have largely sold replacement machines - we replaced those of another manufacturer. With the 70 we expect to get much more new business. We will be selling additional machines to run with other manufacturers' machines."

Delivery of the new machines starts immediately. Worldwide Sperry has taken orders and in the US there are already some systems installed. In the UK the company is poised to announce orders in four general areas: government, manufacturing distribution and "commercial". The company expects to sell 15-20 1100/70s in the UK by next April.

Sperry claims significant price performance with the new family, which overlaps its older 61 and 62 machines in performance and "environmental" advantages - the machine is smaller, with the cpu and I/O units in the same box.

The bottom end of the new family is equivalent to the ICL 2955 and the IBM 4341/9, with the top end equivalent to the 3083B and halfway between the ICL 2985 single and dual processors.

Mentor comes to the UK

by Nuala Moran

NEWCOMER Mentor Graphics opened a UK subsidiary last week to push its computer aided engineering systems on to the European market.

Mentor Graphics was founded in the US in 1981 to develop, manufacture and market micro-based systems for design engineers. Its systems went on sale in the US in November 1982 and since then sales have been \$5.5 million. Sales for the whole year are expected to be between \$15-20 million. Next year sales are forecast at \$50 million with a high proportion of this coming from the European side of the business.

Mentor Graphics UK Limited will set up a European sales and service centre with demonstration facilities. There are plans to open further subsidiaries in Germany and France.

The company will be selling a range of computer aided engineering (CAE) systems including the Idea 1000, 1200, 1300 and 1400 models logic design analysis systems. These are composed of workstations configured into local area networks.

Each workstation is based on an Apollo Domain computer containing a Motorola 6800 16/32 bit chip. There is a high resolution graphics display with an optional electrostatic hardcopy printer, up to 1.5 megabytes program memory and 32 megabytes Winchester disc storage.

It is claimed that these workstations will provide a comprehensive set of design, analysis and documentation for half the previous cost of CAE systems. They can be used to produce and document working designs in printed circuit boards VLSI, thick and thin film hybrids and gate arrays.

Applications programs that can be used with the system include a structured logic/circuit design, assist in creating and capturing logic diagrams, interactive logic simulation, document preparation, electronic mail and programming capability so that designers can write their own application software.

First sales in the US were to a variety of companies in aerospace, motor and electronic industries, including Boeing, Mostek, General Motors, Honeywell, Raytheon, Texas Instruments.

A joint venture also exists between Mentor Graphics Japan and Mitsubishi Hytech, which is part of the Marubeni trading group. An office was opened in Tokyo in April. Hitachi, Mitsubishi and NEC are said to be evaluating Mentor systems.



MBS adds a personal touch

UK SERVICES group MBS is to take the personal route to double its turnover, but only by selling to the bigger users.

The Windsor-based former terminal specialist has sunk £2 million into stocks of micros, and last week officially extended its sales, rental, lease and maintenance options for terminals to multiple users with the addition of training.

And the publicly quoted company is opening six regional demonstration and service centres based on its current sales and maintenance centres.

Mike Brooks, MBS managing director, said: "Our typical client is a departmental user in a medium to large sized company. Companies with 50-100 staff probably wouldn't be interested in what we have to offer."

According to Brooks, companies which already have DP departments, but which don't want to set up training and control sections to oversee the purchase and installation of micros in their departments, would be those most interested in the new service.

MBS has already done deals with such industry giants as RTZ, ICI and Shell.

Brooks said: "On the software side, we are offering the manufacturer's packages at the moment, but we are building up our own library of well accepted industry packages."

Homes move on to Prestel

by Nuala Moran

BUYING a new home and learning about information technology do not sound like complementary activities. But now there is a service that will help people find that "des. res." and also "bring them face to face with information technology and the many advantages it offers."

This is according to Richard Griffiths, managing director of Club 525 Homefinder service, a Prestel-based guide to homes throughout the country. The service already has 150 estate agents in 130 towns subscribing to it.

Anyone wishing to move to a different area will now be able to go into a local agent to locate a house for sale in any part of the country.

By keying in requirements such as price range, area, size and so on the estate agent can show buyers details of the latest properties to come on the market in any part of the country, via Prestel.

"For properties of particular interest, your local agent can use the message sending facility on the service to arrange for full particulars to be sent in the post by the handling agents. He can also arrange an appointment for viewing," said Griffiths.

Information keyed into Prestel by estate agents is processed overnight on Club 525's Systime minicomputer. Properties are sorted according to geographical area, size, price etc. and these details are available to all subscribing estate agents the next day.

The viewing service is free, and helps avoid much of the time consuming process normally associated with moving from one area to another. As information is updated daily, potential buyers see properties before they have been advertised in newspapers.

This also improves prospects for vendors. Details of their property will be available around the country.

There are also considerable advantages for estate agents. Griffiths said: "In a highly competitive field, staying in business, let alone expanding, means that all possible means of offering the public a better service must be considered. Not only do members of Club 525 have a competitive edge over other estate agents, but it is also a service from which they can expect to gain both extra instructions to sell properties, and extra sales of properties already on their books."

The cost to estate agents of being part of the Club 525 network is about £1,500 a year. This includes rental of the Prestel terminal, daily update and Prestel access charges. Estate agents are in control of their property information appearing on the screen, and use the interactive facility to update it.

"To remain in the forefront of property marketing, estate agents realise that they must adapt to modern technology and the fast, efficient transfer of information. If estate agents are not in the business of communicating property information, then what business are they in?" said Griffiths.



GRIFFITHS... Making home buyers face it.

Budge goes to Bahrain specialist

by George Bick

LONDON software house Oliver Budge was bought last week by another Wang specialist firm based in Bahrain for a sum "substantially in excess of £100,000".

Managing director Richard Budge said the offer had been accepted as the best of four serious bids and the arrangement had prevented them going into receivership.

The Bahrain firm, whose UK subsidiary is called Information Systems International, is Wang's dealer for the Middle East. It will be bringing in two new top men, Patrasap Nirmavala and Richard Hunt.

Hunt is to take over as managing director in October; Budge is staying on temporarily as a consultant.

It is expected that 12 to 15 of the remaining 22 employees will be offered jobs.

Budge & Partners ran into trouble when its backer Technical Development Capital refused it a further injection of £150,000 last month. The firm's research division of 10 people had been closed down due to lack of success of the accounts packages among Wang users. The marketing manager, Les Line, who has since left, put part of the blame on Wang.

"They were happy to trade on their word processing reputation and showed little interest in promoting our applications," he alleged. But Wang replied: "We did everything we could to promote their packages. Budge was trying to do too much."

SALES BRIEF

Rodime lands 10m drives deal from US

RODIME, the Scottish maker of disc drives, has snatched a \$10 million order from the US. IBM's national of Nevada has ordered 54-inch Winchester disc drives to be used with eight-bit 2300-based and 16-bit Intel 8088-based micros.

"More than two-thirds of our outstanding orders now lie in the States, and we expect more in the low," says the Scottish company's pleaded marketing director Malcolm Dudson.

In the money

US systems company Modcomp has won a £1 million share of multi-million dollar contract to build a stock exchange in Kuwait, one of the world's quickest growing financial centres. The London Stock Exchange is also involved with five Modcomp Classic II processors providing software and viewdata facilities for brokers and users.

Banking on COM

THREE NCR Computer Output Microfiche systems worth £300,000 are being installed at the Bank of Scotland's computer centre in Edinburgh. Applications of the equipment will include the supply of daily account information in the bank's branches, and storing management reports that had previously been held on paper.

Malaysian order

SPERRY has been handed a £1 million mainframe order from the Malaysian government. The equipment will form the heart of a driver and vehicle licensing system, and will be supplied by Farnas Trading, Sperry's distributor in Malaysia.

Tandon's biggest

THE US Tandon Corporation kept up its recent glut of big orders by resping two orders worth a total \$33 million for microcomputer data storage subsystems. The contracts are the largest yet awarded for systems based on the company's cheapest 5 1/4 inch floppy disc drive.

Prime upgrade

PRIME Computer has won an order from a UK civil engineering consultancy for a computer to upgrade an existing bureau system. The Oscar Faber Partnership has ordered a Prime 750 to link up with an existing Prime 650 for in-house and bureau computer aided design.

Boozy system

LEADING sherry importer John Harvey of Bristol has installed £50,000 worth of computer equipment made by STC Business Systems as part of a data network to pass information on stocks of wines and spirits. The company chose STC in preference to IBM because the equipment was cheaper, and could be delivered more quickly.

Ferranti in gear

FERRANTI has won a major order for its computer-aided engineering system (CAE) from a maker of gear transmission equipment in West Yorkshire. The system, including database management, has been bought to enhance David Brown Gear Industries' existing in-house draughting equipment.

Foreign aid

PORTUGAL'S largest timesharing company is improving its service with the help of the UK company ADP Network Services. Timesharing Portugal is making available a range of ADP's network applications, including Apex, IPL and Oracle as part of a £500,000 deal.



WOOD... Challenging US financial systems suppliers.

The government floats the air waves open

by Donald Kennett

THERE are new possibilities for mobile data communications services. Last week the Department of Industry awarded a licence to Air Call for radio-based telecommunications services.

Air Call, a 30-year-old operator of radiotelegraph and mobile telephone services, missed out when the government gave Radiomobile the licence to operate mobile telecommunications services based on cellular radio techniques late last year. But Air Call chairman John Stanley believes that his company's new licence gives it far greater freedom than the cellular licence would have.

The new licence performs the same function of authorising services as the ones previously issued by British Telecom before licensing was taken over by the DoI under the British Telecommunications Act 1981.

But Stanley said the significant differences in this one included the permission to carry data, permission to dial automatically into the public telephone network from a mobile unit and permission to operate anywhere in the UK.

A general licence under preparation by the DoI to enable other companies to provide similar services is expected this year.

The only remaining limitation is the availability of radio frequencies for carrying his services. Stanley said that this spectrum was full of unused bandwidth and that the government was preparing to make as much of this available as was required.

The Home Office, which controls the allocation of radio frequencies, said that any such comments must be based on speculation about the outcome of the Merriman report on the allocation of radio frequencies.

The DoI spokesman said that his department was now taking a larger part in administering radio bandwidth. Making it available for commercial use was an integral part of the government programme of liberalising telecommunications.

Datasolve takes on US specialists

by John Kavanagh

BUREAU Datasolve has challenged US financial systems specialists MSA and McCormack and Dodge head-on.

The £26 million company, part of Thorn EMI, has formed a package unit to sell a real time accounting system from US firm American Management Systems. And the new Datasolve Software unit is talking to other US firms about taking on further packages.

Datasolve Software is starting with nine staff and is aiming at a £3 million turnover by 1987. "That's extremely realistic," said Keith Harpham, manager of Datasolve's commercial products division. "It took MSA four years to reach £4 million in the UK."

Harpham said Datasolve could no longer afford to disregard the software products market. US forecasts showed packages would be the biggest computer services sector in the US by 1987. The same trend would occur in the UK, but less quickly, he said.

American Management Systems in big in the US, where it has a turnover of \$70 million. That compares with \$101 million at MSA and \$40 million at McCormack and Dodge. MSA's figure is boosted by sales of microcomputer packages by its Peachtree Software subsidiary.

The product Datasolve is taking, Corporate Financial System, has 40 big US users. It is being offered to users of IBM 4300s and bigger IBM mainframes.

Datasolve managing director Chris Wood said the package "creates new standards for mainframe applications software by overcoming the inflexibility of earlier generations of software of this kind."

It included an online database and productivity aids to streamline development and maintenance. It was a real time system because financial managers needed immediate updates just as airline pilots did.

Harpham added that competitive packages were largely batch systems which had been adapted in for online working.

But Mark Bennett, marketing manager at McCormack and Dodge in the UK, said there were misgivings in the accountancy profession of the value of real time systems.

"Accounts are doubtful about how far you can audit such systems," he said. He added that his company had recently announced a real time package in the US. It would be in the UK this year, he said.

Datasolve is demanding exclusive rights to the packages it is considering. "We're taking a hard line on this," Harpham said. "It shows the suppliers the seriousness of our intent in this market."

that need computers

DEVELOPING countries now have the chance to use computing to help solve their urgent problems at a cost which is within the grasp of even the poorest nations. Their top priority should be to define their information needs in areas such as health and agriculture.

So says Alan Benjamin, chairman of the British Computer Society's developing countries specialist group.

Writing in the group's newsletter he says shortages of skilled staff in crucial social areas are matched by a lack of accurate technical information.

"Books are becoming much more expensive and often represent an additional process barrier between those who need information and those who have it," Benjamin says. "The price of portability, the book's great asset, is fast increasing to meet the price of electronic information."

The developing countries group is holding a conference on transport planning and traffic management systems in the Third World, on July 7 and 8 at Sussex University in Brighton. Details: 01-836 2208.

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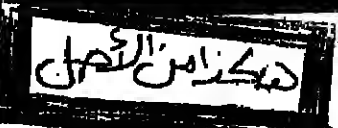
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IN 1978 the UK public bought itself into one of the world's high stake games - the manufacture of advanced microprocessors in

quantity. Five years later Immos is strapped for cash, has taken a 60-80% slice of a specialised market worth \$30 million a year and looks to be

one of the last entrants in the race to produce the once fabled 64K RAM in quantity. The cost so far has totalled £115 million. Ivan Berenyi reports.

The PR director who hates talking about his firm . . .

HOISTED on a 30 foot pole mounted on decorative masonry, the Union Jack fluttered proudly 10 yards from the entrance. "This must be it," states triumphantly the veteran taxi driver, who claims to know every nook and cranny in town. Yet it took him an hour to find the way from Immos' other facility on the Harrison Park Industrial Estate.

Contrary to one's assumptions, and the widespread belief back in London that Immos is one of Colorado Springs' largest employers, ordinary people do not seem to have heard the name.

On entry into the imposing Immos corporate HQ, a huge copper plaque meets the eye. Fixed on the marble wall at an inescapable spot, is an announcement that Princess Anne and Captain Mark Phillips officially opened the building on June 18, 1982.

Arranging to meet PR director Brad Hartman had taken 18 phone calls in five days. I was escorted by reception to the visitors' waiting area, which comprises seating for 12 and a table laden with mugs, located between the reception and a corridor leading to the cafeteria.

A request to have a coffee in the staff canteen is firmly turned down by the security man at the reception desk. "We can't spare an escort just now," he says. I look at the beautiful view outside the window, with Pike's Peak beckoning from the distance and idyllic greenery and a lake nearby, and the resort to the mags.

There is something odd about them. The address labels have been carefully removed from most, hurriedly torn off of others, and the two mags that still have them are addressed to private addresses. Of the 26 mags, 22 are more than six months old, and one can only conclude that the company is either less than keen on visitors knowing employees' names, or is simply economising.

There is hardly any movement in the big hall, just one or two people come in to pass through the cash doors every 5-10 minutes. There is no atmosphere of business. It's a quiet backwater. Hartman is almost an hour late.

But suddenly two persons arrive with rolled-up sheets of paper under the arms, settling in the waiting area. A conversation develops

and it turns out that they are building a house for Hartman. "It's odd," one of them says. "All the middle- and top-management in this firm is suddenly building residences nearby. Good for us though."

On being asked if they built the HQ building, the other offers the name of the architects who did and laughs. "This is a big-time project," he says. "It must have cost \$40-50 million, together with the land. This is THE prime site in Colorado. Immos certainly got into real estate . . ."

Hartman turns up suddenly, looking harried and determined to stop all contacts. He can only afford five minutes for talking about the company, but will not answer to a single question. "We must have two weeks advance notice and approval from the UK to receive a journalist," he says. On being asked if any British journalists visited the HQ at all, he just shakes his head.

The surprising secrecy shrouding everything linked with Immos continues when one contacts their bankers, architects, contractors - you name it.



HARTMAN . . . "The total cost of the Cheyenne Mountain site and of the corporate HQ building on it? Let's talk value. That's between \$30 million and \$90 million."

All Becky Johnson of the Gates Land Development Corporation, which sold the land to Immos, would say was that the site is 34 acres and the buildings occupy 102,000 sq ft. The cost? She can't comment on that, but engineer Bob Flakowski will call back. He does not, and further calls are curtly refused.

Roger Anderson, the architect who designed the buildings, is just slightly more forthcoming. He discloses that the two buildings erected cover an area of 135,000 sq ft, and represent Phase I of the total complex planned to be built in due course on an area of 360,000 sq ft. He admits that Phase II has never been scheduled yet, and "may never be", and then he had to sign an undertaking not to give information to any outsiders, least of all the press.

"Look, there was not even a single Press release on either the design or the construction of the buildings," he says. "Immos is pathologically sensitive to any information being passed out. I

don't think I should talk to you without clearance . . ."

At the Planning Commission, city planner Mike Robinson does go into the ins and outs of light industry park zoning, and the restrictions it places on a manufacturer, but he would not receive a second call, and neither would his colleague, Bob Walcott.

Similar experiences await one at Immos' bankers, the First National Bank of Colorado Springs. First VP Gordon Culver "will not be in for days," once the secretary explains the nature of the call. Director Ross Vogo is also constantly out of the office. Loan officer David Tonk finally takes a call, but refers back to Culver.

Col. Jack Stapleton, who headed a protest group of nearby residents, from the Stratmoor Hills Park Estate, against a plant being built on the adjacent Cheyenne Mountain site, is a whole lot more forthcoming. He says that land prices are high in the area, averaging \$25-32,000 for a 1/4-acre lot, and that the zoning regulations are

strictly observed, limiting industrial activity, traffic, even the height of light poles and the number of employees. "We can't let a plant erode the quality of life here," he says.

But how many people does Immos employ? 700, says Hartman. "660," says Frank O'Donnell of the Economic Development Council, but admits later that it's a figure which had been supplied by Immos a year earlier, and that the figure maybe closer to 500 now. The two local papers, *The Gazette* and *The Sun* think it's between 3-400, and that Immos is between the 40-50th largest employer in town.

The Pertec/Computer Mail micro shop's manager thinks Immos has "five or six locations in Colorado Springs". Hartman now up to two - the HQ on Cheyenne Mountain and the Harrison Park test/assembly facility. He claims that the Garden Valley and the Jentell One buildings have been vacated, as well as the rented city offices.

Optical disc in mass production next year

by Jack Gee
THOMSON-BRANDT is to begin mass production of its digital optical disc, the Gigadisc, next year in the hope of achieving worldwide sales of 10,000 units in 1985, the French State-owned company said in Paris.

The announcement followed the presentation of a prototype of the Thomson unit, which is to be manufactured in partnership with Xerox, at the Congressional Library in Washington where the two companies are bidding for a massive order.

Under an agreement with Xerox, Thomson will manufacture the Gigadisc in France for the European market, and Xerox will make and sell it in the US.

Unit retail prices will be in the range of 70,000 to 100,000 francs and discs, which cannot be erased, will cost between 150 and 250 francs.

Thomson officials say the French firm is confident that after 12 years of research and development, it can make a major breakthrough with Gigadisc.



SHOCH . . . "Everything the ADO programming environment is supposed to be but isn't."

Harris set to make minis in France

by Jack Gee

HARRIS Corp has begun negotiations with the Bull computer group to build scientific microcomputers in France, and is hoping to extend the product range manufactured by Matra Harris Semiconductors, its joint venture with the French electronics firm.

John Hartley, Harris president, said in Paris that his corporation was ready to begin making minis and to transfer part of its research and production capacity to France, if the French government agreed.

Hartley added: "If we want to succeed in Europe, we have to be present in France. This is our number one objective on the old continent which represents 90% of our sales outside the United States. We are open to any proposition."

Harris is keen to use France as a manufacturing base for microcomputers for use in engineering and education and seems eager to speed up its negotiations with the

French authorities.

But an early agreement seems unlikely in the current confused atmosphere of France's State-controlled computer industry. The American group had earlier begun talks with Matra on a joint computer manufacturing venture. The Matra Harris Semiconductors venture has been working to the satisfaction of Harris, so it seemed logical to choose an existing French partner for the new project.

The alliance between the two firms dates back to 1979 and is aiming for the turnover of 700 million francs (£63 million) in 1985.

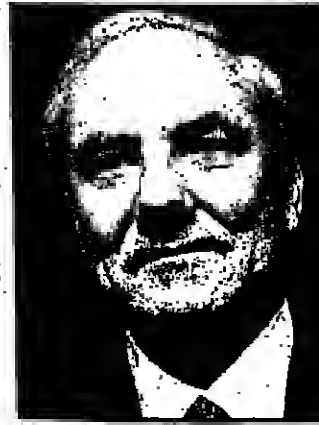
But under France's five-year national electronics plan - the so-called Filière Electronique - Matra has been excluded from microcomputers. So Harris has had to turn to State-owned Bull, the parent company of Cii Honeywell Bull, in which Honeywell retains only a 20% share.

Harris, which earned 30% of its total electronics turnover of \$1.3 billion last year from information technology, has now been operating in France for five years.

It expects its French turnover from computer activities, which totalled 20 million francs (£1.8 million) in 1982, will rise by over 20% over the next five years.

Semiconductors represented 11% a year of world turnover for the group and, in spite of a drop in sales last year, Harris expects an annual increase of 35%.

This explains Harris' readiness to introduce new products at the factory in Nantes, on the French Atlantic coast, which it operates with Matra.



HARTLEY . . . Keen on France.

AD&T wins go-ahead

by Howard Karten
AT&T has won FCC approval of its proposed X.25 packet-switched service. The FCC (Federal Communications Commission) had asked AT&T to change the proposal it submitted in March 1982, when the FCC concluded that the original filing was dedicated solely to American Bell.

It thus violated guidelines of the so-called FCC Computer Inquiry II which laid the foundation for AT&T's unregulated offerings. The Bell Packet Switched Service (BPSS) is a regulated offering of AT&T, and will be the foundation of an enhanced service to be called AIS/Net 1000, offered by the unregulated and separate

AT&T subsidiary American Bell. BPSS will allow shared use of BPSS facilities by unrelated users.

Current contracts between AT&T and its unionised employees expire on August 6, and the impending break-up of AT&T into 22 operating companies plus Long Lines and Western Electric, may complicate matters. For example, there is the question of whether a new contract would apply to the 22 new companies.

About 650,000 employees, represented by three separate unions, are involved, and many are said to be anxious over the future and which company they will eventually be working for.

Continued on page 9

'Wonder' boost for programmers

by Donald Kennett
XEROX's Mesa programming environment is being taken out of the laboratory and put into its first Beta-test site at an unnamed customer installation.

Xerox vice-president for office systems John Shoch said last week that it would be on open sale in about a year.

Mesa has been under development at the company's research centre for 10 years, alongside Smalltalk and EtherNet, where it is claimed to have worked wonders for company programmers' productivity. According to Shoch, a typical output per programmer on complex major projects is 2,000 lines of debugged and tested code per year, while Xerox's team has been achieving 3,500 lines a year using Mesa.

"It's everything the ADO programming environment is supposed to be but isn't," he said.

At the same time, the office automation software it has been

used to develop provides everything the International Standards Organisation's Open System Interconnection scheme is supposed to but doesn't, according to Shoch.

The triumph of OS-4, the latest version of the office systems software, was at Hannover Fair in April and the US National Computer Conference last month, where the system was shown supporting interworking between seven different types of workstation and 12 different types of network server, he said.

"No other vendor can show that kind of capability," he added. "Ethernet is only 10% of the solution to the problem of interconnecting and most of our competitors are just beginning to discover it."

Both Mesa and OS-4 run on Xerox 8000 series processors. Whether they are adapted to run on other systems "will depend on what the market tells me," Shoch said.

Without going into detail,

Shoch said the secret of Xerox's programmer productivity was based on a large range of principles, starting with the things that separated a programmer who could write code that somebody else could maintain from one who wrote code that only he could maintain.

"The task is very different when you have a system of a million lines with thousands of modules written by hundreds of programmers," he said. "You need very specific management to control it."

Using Mesa on the development of its office automation software had enabled the development team to add features to the system efficiently and to meet scheduled dates reliably.

The difference between Mesa and its rivals was that typically the rivals were not backed up with a whole array of functions. All Xerox systems had greater depth than their rivals and imitators, he said.

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The £50m pledged over lunch

TWO invitations and a lunch - all in 1977 - marked the birth of Immos as an idea backed by more-or-less-firm NBB commitment. Both invitations were extended to Dr Richard Petritz, rolling stone of the US high-tech scene, by ambitious British DP whizzkid Prof Iann Barron, and the lunch, which will have cost the British taxpayer the best part of £115 million, also involved the NBB's Sir Leslie Murphy.

Having acted as consultant to the NBB and made many promising political contacts in the ranks of an expansionist Labour government, glimpsing a chance of State funding for a leading-edge technology start-up, Barron first invited Petritz as panelist to a DP conference in Toronto in August, 1977.

It was a meeting of like minds. Petritz claimed to have the winning formula that Barron had been casting about for. It was a VLSI start-up with \$50 million funding, which could mature into world prominence and be ready for going public within five years undisturbed, without the need for squandering equity on loans. But, he admitted, he still needed a Big Daddy.

Barron's next invite, for a meeting with an already half-convinced Murphy in London, spawned the historic lunch in December, 1977. Arriving with a detailed plan of his scheme, and with the impeccable credentials of the founder and one-time president of Mostek, Dr Petritz completely overwhelmed Murphy, who was quoted to have signalled this whole-hearted encouragement and pledged \$50 million of NBB cash by the brandies.

Striking the iron while it was

hot, Dr Petritz was back in London in January, 1978, by which time Barron is said to have convinced the NBB that insufficient account had been taken of inflation.

The sum deemed necessary to give the company clear sailing for three-four years without loans or stock sale was tentatively raised to £100 million and it was suggested that the company would go public when it reached \$100 million annual sales and that the NBB should retain 70% equity, with the rest going to the cofounders and key staff.

In the latter respect, Petritz disclosed that he had already followed up on a preliminary discussion held way back in February, 1977, with Dr Paul Schroeder, one of the top men in Mostek's memory design firmament, who was ready to join with a group of designers.

In March, 1978, Dr Petritz presented one of his famed papers on the benefits of the scheme to the NBB, and a whole series of discussions took place, until on March 31st a 9-strong NBB Executive made up of four capitalists and five trade unionists, as Petritz himself related later - unanimously agreed the loan proposal.

It was one down, one to go for the Barron-Petritz duo, with the Dol still to be won over, but the British semiconductor industry got wind of the plans, so did the Press, and the ensuing battle over its feasibility raged for months, until the all-clear was given. Schroeder and five others joined from Mostek and Immos Corp started operating out of a rented office in Dallas in August, 1978.



PETRITZ . . . famed

The Immos diary of woe

May 1978. "K-MOS" gets the "in". It becomes Immos, as NBB/DOI give the nod. July. NBB publicly pledges £25m and indicates that an identical sum will become available later, if the performance is right, for the launching of Immos, which is to have a US development unit (eventually to employ 1,000), a Far Eastern plant for packaging assemblies and 4,000 UK staff by the mid-1980s. In the US, Dr Paul Schroeder and five others join Immos Corp from Mostek. Petritz, Schroeder and Barron are named cofounders, with a 5% stake in Immos International, the holding company, of which all three become directors. Barron is named MD and Petritz a director of Immos Ltd; Petritz president and Schroeder executive VP and CEO of Immos Corp.

August. Injunction filed against Immos Corp in a Dallas court to restrict ex-employees from passing on Mostek trade secrets. Gill Rilling and Brian Stevens - Barron's former SRC panel colleagues - join Immos Ltd. September. Temporary injunction granted in US against Immos Corp's plans to design 64K RAMs. Dr Petritz makes his fourth visit to Colorado Springs, and hires a dozen of top- and middle-management calibre - most local Colorado Springs residents. They include Dr Tom Hartman, Dr Fred Gnadinger, John Heighley and Michael Burton. October. Of Dr Schroeder's ex-Mostek group, three - Ward Parkinson, Doug Pittman and Dennis Wilson - are offered a two-year consultancy contract by Mostek and leave Immos/Dallas to set up Micron Technology in Idaho. Immos Corp calls the departures "insignificant". NBB approaches Ferranti, in which it holds a 50% stake, with a request

for taking Immos under its wings. November. Barron confirms that Bristol is to be the site of the Technology Centre. Immos Corp rents offices in two locations in Colorado Springs.

January 1979. Bristol is confirmed as the site of the Technology Centre, and Barron announces that the site of Immos Ltd's four production units will be "at one or more" locations in the UK, with the final choice subject to a study by PA International. Manchester MPs, furious about the Bristol siting, threaten to withdraw support for the funding of Immos unless the NBB assumes greater control over the location of investments. Colorado Springs is confirmed as the site of Immos Corp's HQ and Technology Centre and four executives are appointed - all to report to Schroeder. They are Dr Tom Hartman, 47, productions VP; Dr Fred Gnadinger, 38, director of technology; John Heighley, 42, director of memory component development; and Michael Burton, 35, director of administration and financial planning. Petritz holds a press conference, says the Immos Corp expects to spend \$40m and generate 1,000 jobs in Colorado, and that the company will attract the "superstars" of US technology and "the pick of the British".

March. Sir Keith Joseph makes it clear that the Tories, should they win the election, would sell off the NBB's investments. Concerning Immos specifically the Centre for Policy Studies (CPS) think tank indicates that the nature of the contract between the NBB and Immos would decide whether the company would be sold or not. April. The government tries to persuade GEC to take Immos off its hands, but the talks soon fizzle out. Richard Hall is nominated finance VP for Immos Corp. May. Immos Corp claims to be

ahead in the field with its 16K static RAM, expecting to start sampling by year's end, with the sampling of 64K dRAMs "not far behind".

June. NBB begins to wilt under pressure for moving plant site from Bristol to South Wales and continues efforts to sell Immos. August. STC steps away from Immos offer, and the government approves the second £25m payment, provided that Immos is prepared to site the plant in South Wales.

September. Immos Corp nominates three new VPs: Heighley (memory products), Gnadinger (technology) and Ralph Bohannon (production), all 1978 recruits. Douglas Rankin, who had been with TI for 16 years and gets the marketing VP post. Is the sole newcomer at top level.

October. A 33 acre site at Dwyry, Newport is to become the site of the £25m plant.

February 1981. Immos Corp announces details of its 64K dRAM at the International Solid State Conference in New York.

March, April, May. Immos names 40 agents, 66 distributors and plans the opening of five sales offices. The agents include Matsushita Electric Trading in Japan. June. NBB discloses that Immos £29.8m of its £64 RAMs, halves price of its 16K RAMs. July. Lawrence H. Goldstein - a senior engineer at Immos Corp - receives the \$1,000 Brownlee-Thompson award from the IEEE. Unhappy about the moving of the factory site from Bristol, Barron talks up a storm about a possible Japanese factory, to be set up jointly with a Japanese manufacturer. Schroeder starts to "emigrate" himself (his own words) from Immos, giving up the CEO August. Dr Schroeder quietly

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Which firm has Picked the winner?

by Claire Gooding

TWO major backers of the Pick operating system, formerly partners, are now going into competition. They are Neil Ratcliffe's IDM, based in Doncaster, and Nick Drescher's UCL, in London.

UCL is backing Epick, a Pick look-alike which sits on top of the popular CPM operating system. Epick was developed by UCL to bring the power of the mini software down to the micro.

CPM commands and Wordstar word processing can be used from inside Epick, which is fully compatible with the "true Pick" - Dick Pick's own system - on the larger machines.

It can run the library of applications for the Ultimate machine, a Honeywell and DEC hardware-based system running under Pick which UCL distributes in the UK for the Ultimate Corporation.

Although Epick envisages Epick as an end-user tool within an Ultimate data processing shop, it can also be bought as a standalone system based on the Cifer terminal. Standard applications such as Micromodeler will run under the

CP/M and Pick combination, opening up a potentially huge market for UCL.

Drescher argues that a Pick system has what is needed to support a relational data structure. "The micro market is getting very sophisticated - users are beginning to demand database facilities," he said.

Epic's implementer Tim Roberts said: "If Pick does a version himself he will do it better, but he hasn't and people are in a hurry to get Pick on to micros."

But IDM managing director Neil Ratcliffe says he is not impressed with Epick, which he claims is no competition for his IBM PC version, Revelation. This is being distributed in the UK for Cusinos of California by IDM.

Ratcliffe, like Drescher, sees Pick on the verge of a big breakthrough, but he thinks this will be spearheaded by Revelation and the long-rumoured micro version from Pick's own computer works.

Revelation supports its own enquiry language and applications generator called R/Design.



DRESCHER... Users are beginning to demand database facilities.



RATCLIFFE... Epick is no competition for Revelation, he claims.

Ratcliffe estimates there are 30,000 Pick users, twice as many as Unix users. He hopes to sell 500 Revelation copies this year and keep selling them at the rate of 1,000 a year.

He says IBM is showing "unusual interest" in the system,

which runs on the Series 1, the 4300 series and other IBM machines.

Ease of use is Pick's great attraction, he argues, and it is in this area that it scores over Unix. The original Dick Pick is now encouraging OEMs to use the Pick

title rather than call it by proprietary names.

Ratcliffe and Drescher are both ex-Microdata employees (CMC). A long-running dispute between Microdata and UCL over an Ultimate systems contract was finally settled last week, when a High

Court judge ruled on payment of court costs in favour of Microdata (See page 2.)

Earlier in the year Microdata agreed to accept £67,000 paid by court by UCL to end the dispute. Microdata had alleged that UCL "stole" one of its customers.

£100,000 plan to stop piracy

A £100,000 software protection project is under discussion between the British Technology Group, the National Physical Laboratory and a number of private firms.

The plan is for a joint research team to look at methods of combating the growing problem of piracy. Half of the money would come from the government, half from industry. Up to about 20 companies could be invited to take part.

Derek Grover, chairman of the British Computer Society's software protection group, said that they wanted to centre on the concept of "the tamper-proof module," which was being seen as the only effective means of achieving security of programs.

Organisations could be asked to pay a £5,000 annual fee for a report on the findings of the group.

"But we have to be open-minded about the scheme at present because we don't know what the solution will be," he said.

John Cartwright, ICL's patent services manager, told the BCS specialist group that injured parties should consider asking to be allowed to take a computer into court.



GROVER... Focusing on the "tamper-proof module".

"In the US screen displays have been used as a part of evidence and you should consider doing that here too. I see no reason why it should not succeed," he said.

Copyright law stated that ideas were not protected - yet there was plenty of case law to show that literary plots and original ideas had been considered by judges as products which had been copied and were covered by copyright. "In the US, programs in almost every kind of medium have been held to be copyrightable," he said.

But in this country so far most cases had been limited to an injunction. So far no case had gone to appeal.

Olivetti markets Forth for M20 micro users

by Philip Hunter

SCIENTIFIC users of Olivetti's M20 micro who are fed up with writing in Basic can now program in a language designed especially for their application. British Olivetti, is marketing in the UK an advanced version of the language developed by small, Derby-based company Tower Associates.

The language, called Olivetti, is tailored for the 28001-based M20 from the original standard Forth developed in the US.

Software File is compiled by George Black

Scots are first to get major US package

AN American manufacturing package has just been installed on a DEC PDP11/25 at a Scottish site.

— and Fraser Williams, which has UK distribution rights, plans to push the system in competition with IBM's Masipak.

The software, written by TEC of Massachusetts, already has 55 US users. First British user is the hydraulic engineering company Orson Power in Scotland, part of the Dowry Group.

Orson commissioned Fraser Williams to find a manufacturing package to run on its DEC

was developed for CSI by Rational Data Systems of New York.

The incompleteness of Digital Research's best-selling micro operating systems, the CP/M group, with minicomputers, has in general meant that many mini users were locked out from applications software which they were keen to have.

The range of CP/M software, greater than that of business applications for minis, is unavailable.

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The range of CP/M software, greater than that of business applications for minis, is unavailable.

CP/M gives new life to old minis

DATA General hardware users are being offered access to the galaxy of CP/M operating system-based applications programs.

The system has been put together by Cohra Computer Services of Whyteleafe, Surrey, a six-strong team operating in the Data General field. The solution, called Mirage, is being distributed by Cohra for Custom Systems Inc (CSI) of Minneapolis, a system house and DG OEM. Systems software

was developed for CSI by Rational Data Systems of New York.

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Software by numbers

COMPUTER programs are to be numbered, under a plan introduced by the American National Standards Committee. ANSC-239 has set up a subcommittee to design a standard numbering system for software.

The idea is that products could be identified by publisher, language, minimum hardware configuration, operating system and edition, according to ANSC-239 chairman Sandra Paul.

"We hope the new subcommittee will be able to focus the needs of the diverse companies and groups in this industry," she said.

Research's best-selling micro operating systems, the CP/M group, with minicomputers, has in general meant that many mini users were locked out from applications software which they were keen to have.

DBMs can learn new words from the user

MATHEMATICA is branching out into artificial intelligence systems. The American authors of the Ramla-II database manager have extended the software with an English processor which learns words from its users.

The processor has a vocabulary of some 3,800 basic English-language terms which is currently being enriched by Mathematica's expert systems team to 4,500.

But when it encounters a word it doesn't understand it tells the user so and gets him to explain it. It then records and files the word for the future reference.

The general dictionary is linked to two other Ramis word files, the Ramaster flexible data dictionary and the file-specific dictionary for compiling technical and personal expressions.

Bernard Fine, Mathematica's senior vice-president in the US, said the firm would not seek the patent the term "English" as there were already several using it, including Rapid Data and Cul-rance.

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MICRO NEWS

Harris opts for Slough as its Euro base

HARRIS Semiconductor has picked its UK subsidiary, Harris Systems in Slough, as the base for its European expansion. Harris Systems will serve as the headquarters and trading centre for all European markets.

The Slough-based operation will be a joint company set up between Harris and its French partner Marre-Harris Semiconducteur, called Harris/MHS, and will be headed by senior vice president Ralph Kaplan.

"Europe already accounts for nearly 20% of Harris Semiconductor's \$160 million a year sales," says Kaplan. "It is the company's largest market outside the US, and has by far the greatest growth potential - particularly with the burgeoning telecommunications industry."

Harris plans to double European sales of US-produced Harris components and French-built MHS circuits by the end of 1984. The



KAPLAN... Wants growth.

operation will bring together Harris' custom ICs and its standard analogue, bipolar and CMOS lines.

To speed up things for its European customers, Harris and MHS have started work on a joint management information system, to be located on a mainframe at MHS's Nantes site.

Online terminals will link all European sales centres with Slough, Nantes and the US production plant in Florida.

Computerised customer dial-up designing facilities will also be available throughout Europe, adds Kaplan.

Will programs be a hit?

by Andrew Thomas

LAST week saw the release of, allegedly, the world's first computer pop record. The single, by Chris Sievey, has a song called Camouflage on the A side, and three programs for Sinclair ZX81s on the other.

Camouflage is a reasonable song and certainly sounds a lot better than the B side's squeaks and whistles. But when loaded into a ZX81, the first program displays the lyrics to the A side, in sync with the song, along with graphics.

Sievey bought his ZX81 on impulse, with money set aside for the phone bill. After two weeks work, the graphics for Camouflage were complete, but the phone had been cut off.

The disc will sell for around £1 rather than the usual £5 for normal packaged ZX81 games.

And Sievey and some colleagues have been signed up by EMI Records to produce more games to go with songs recorded by other artists.



SIEVEY... Bought a ZX81 with his phone bill fund.

Acorn grows taller

by Philip Hunter

ACORN has taken over from Sinclair as the biggest selling maker of home computers in the UK according to one survey. The success of its BBC micro bought it a quarter of the market in 1982, compared with just over 20% for Sinclair.

Sinclair was the biggest selling maker of home computers in both 1981 and 1980. In 1982 Sinclair still led the market in volume, with the £70 ZX81 accounting for 40% of total units sold.

Home computers are defined as those costing under £500. The UK market leader for personal computers in the £500 to £3,000 range was Apple, followed by Sirius. In volume terms Apple and Commodore shared the lead, both accounting for 15 to 20% of units sold.

The survey took place just before the launch of the IBM Personal Computer, and was designed to size up the market. In 1982 the Fortune 1632 and the Systime S500 were two of the most successful machines in the market for workstations costing £5,000 to £10,000 at the top of the micro range.

The UK market for micros is the biggest in Western Europe, mainly because of the boom in cheap home computers, which have not caught on in West Germany and France.

"West European Markets for Microcomputers: France, West Germany, and the UK - three new BIU Multi-Client Studies. £1,000 from Multi-Client Research. The Economist Intelligence Unit, Spencer House, 27 St. James Place, London SW1A 1NT.

Micro News is compiled by Robert Parry

Why software is crucial to LANs

by Donald Kennett

OPERATING software will be crucial to the spread of local area networks, but performance will not, according to a report from the US.

The report differentiates between what it calls personal computer networks, with data rates less than three megabits a second, and high-performance systems such as Xerox's Ethernet and its broadband rivals, which operate at 10Mbps.

All the moves by the Ethernet partners to reduce the cost per device of using their networks will be paralleled by personal computer network makers who will be working at a much lower price level all along, according to the report's authors Strategic Inc. The result will be to make hardware costs negligible on personal computer networks.

Strategic's president Michael Killen said that many network vendors tried to sell a high-tech

solution to a low-tech problem. Personal computer networks were being installed in large numbers because they were invisible components in application packages.

"The people who bought them bought a solution," he said. "They didn't even know they were getting a network."

Network software has initially been designed to support existing single-user operating systems, with one or two applications such as electronic mail tacked on, the report says. Increasingly, however, purpose designed network operating systems will appear, along with a growing number of networking applications. Access to outside systems, involving various protocol emulations, would be a requirement.

Number two is Datapoint with 5,500 2.5Mbps Arcnets, followed some way behind by Teleview.

From the UK, Acorn's Econet and Rasal-Milgo's Planet get honorable mentions.

*Personal Computer LANs, \$970 from IPI, Nindre Ringvej 201, 2600 Glostrup, Copenhagen, Denmark. Tel: 010 452 63 20 44.

Included in the definition of personal computer network were the products of six dominant suppliers which ranged in capability from Teleview's eight-bit and 16-bit service processors, each of which support a maximum of 16 workstations, to Datapoint's Arcnet which can support hundreds of terminals and processors.

The issue of market share is avoided, but Corvus is shown as top by number of installations with 3,000 Omninet capable of linking 64 workstations at 1Mbps plus 5,000 Constellation multiplexers capable of linking eight workstations at 250Kbps.

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KILLEN... Invisible networks.

The Inmos diary of woe

From page 6

April. Inmos Corp searches high and low for English-born "trans-Atlantic type" with finance background, and four people are short-listed.

May. Work stopped on extension to Inmos Corp's Harrison Park building due to state-wide construction strike in Colorado.

June. Tories win election, and Industry Minister Lord Trenchard hints of privatisation of Inmos. Inmos Corp swings into feverish action. A bevy of US journalists are wheeled in to interview Petrizz about his varied career, and the company applies for re-zoning of a 54-acre prime residential site on Cheyenne Mountain, west of Stratmoor Hills, to the Colorado Springs City Council. Rasmussen Ingle Anderson, the well-known San Francisco architect, is commissioned to complete design plans for buildings on the double.

July. Petrizz claims that Inmos Corp will bring a \$28m payroll and \$4m annual taxes to Colorado Springs by 1984, creating 1,463 jobs in the process. Petrizz, who will be filled by local residents. To the NBB, he gives a presentation on how steeply property values will rise in the post Stratmoor Hills area in an attempt to justify the massive investment in real estate. The first impression of the design plan by Roger Anderson, senior partner in the Frisco firm of architects, raises the ire of local residents, who form a protest group under Jack Stapleton, a retired colonel and estate agent dealing in private plots. But the fully detailed second design of

a four-phase, \$68m complex is approved by the City Council.

August. Inmos Corp pays up and settles the Moszek lawsuit out-of-court. The number of local authorities offering sites for Inmos Ltd plants swells to 200, as PA grades the applicants. Petrizz finds his own English-born financier and hires Richard Hall from EMI in Connecticut.

September. PA completes its report on possible Inmos Ltd sites. The construction of the Inmos Corp HQ starts on the Cheyenne Mountain site, with the G.E. Johnson Construction Co Inc of Colorado Springs as general contractor.

October. Richard Morris, the NBB's vice-chairman, and newly-appointed chairman for Inmos announces a short-list of plant sites and says that the company is on course, with 50 staff in both the UK and the US.

November. Richard Hall, who "had been involved in high-tech finance since 1967," joins Inmos Corp. Tyne & Wear Regional Authority declares a £100,000 bid for the Inmos Ltd plant.

December. Gill Ringland leaves Inmos for Modcomp in Wokingham.

January 1980. Bristol gets the NBB's approval for the "first plant", as a result of Ian Barron's resolute lobbying. This - an exuberant Barron announces - is to occupy 150,000 sq ft, cost £24m and be erected on the north-west side of the city, near the M32, to employ 1,000 by 1983, and to produce "tens of millions" memory devices already by 1982. The first device is to be a 16K static RAM,

followed by the long-mooted 64K dRAM and MPUs by 1983. The second - bigger - plant is to be started in 2-2½ years and to be built from Bristol-generated profits in an assisted area. The NEB says £8m was spent of the first, and it is now to apply to Keith Joseph for the second £25m payment. Addressing a breakfast meeting of the CS Chamber of Commerce, Petrizz claims that the British government had already approved the second £25m term in December, and produces a lot of statistics. Thus he says that in 1979 Inmos Corp had a £1.5m payroll, a £230,000 local shopping bill and that it brought in 54 staff.

February. Northern MPs clamour for the site of the second UK plant. Austin Knight, the New York recruitment agency, gets a £350,000 budget for the year from Inmos Corp personnel director Stanley Bloom, and targets its structured, sweeping ad campaign on playing up Colorado Springs.

March. Amidst rumours that the second £25m is due to be approved soon the pressure mounts to move the factory site from Bristol to an assisted area.

Paul Schroeder, Inmos Corp's mainstay, begins to lose interest: he stops promoting the theme that "not being first into the market with the 64K dRAM does not matter," because Inmos could do the same that Moszek did with its differently designed 16K RAM in eroding Intel's market dominance, and takes to saying that leaves Inmos Corp. His departure is not announced, and the BTG only hears of it weeks later. John Heightley takes over as acting CEO.

April. Doug Rankin resigns as marketing director and joins Signetec.

May. Rumours abound about the possible replacement of Petrizz.

December. Barron announces the Transputer.

January 1982. Inmos Corp recruits production staff, but no figures are disclosed or announcements made. The buildings on the Cheyenne Mountain site are completed and equipped.

March. Occam language is announced by Inmos Plc. The company claims that the Newport plant is on schedule and should enter into full-scale operation in July.

July. Inmos starts clamouring for £10 million more BTG cash. August. 64K dRAM production started officially.

October. Losses mount, but Petrizz fights off an attempt to replace him as chairman and CEO of Inmos Corp. Industry Minister Patrick Jenkin declares that Inmos would both get more money.

November. £224,000 (\$350,000) paid to Dr Schroeder as redundancy pay, although he left the company on his own accord.

December. Inmos on the bread-line and clamouring for a BTG bail-out. The company sells a few batches of chips in Japan and claims a breakthrough into the big-volume Japanese market.

January 1983. Inmos is granted £15m in bail-out funding by the BTG. Malcolm Wilcox pays a half-day visit to Colorado Springs and replaces Petrizz as chairman of Inmos Corp. Petrizz remains managing director and CEO.

April. Doug Rankin resigns as marketing director and joins Signetec.

May. Rumours abound about the possible replacement of Petrizz.

Ex-Inmos trio had no problems with dRAMs

HAVING left Inmos and set up Micron Technology in Boise, Idaho in October, 1978 on the strength of a two-year consultancy contract from Moszek, chip designers Ward Parkinson, Doug Pittman and Dennis Wilson had a 64K dRAM prototype by the autumn of 1980, erected in 52,000 sq ft water lab and assembly plant by June, 1981 and started serial production of the 300ns and 200ns chips in December, 1981.

Today Ward Parkinson is chairman, twin Joe Parkinson is president and Doug Pittman is VP of MT, which employs 350, ships 500,000 64K dRAM parts a month and is due to

come up with a 256K dRAM product family in the first quarter of next year. More interested in systems development, Wilson left to start his own firm.

The company has been shipping 150ns parts for over a year and has a new 120ns part, the 4264A, which has the smallest die size (22K mils) in the business, with 780 possible dies per 4in. wafer.

Chips apart, MT developed a 32,000-element image sensor. This is sold in 1,000-pp volume, and the company also offers two products based on it - the photophone, for flashing images via phone lines on to a TV set, and the micro- eye, which can be

linked to all major PC models and "has tremendous possibilities in robotics" according to Pittman.

Why did Inmos have troubles with its 64K dRAMs? - asked CW of each of the three MT founders over the phone. How come that MT could get so much further, when it only had a small fraction of what Inmos Corp got as investment cash?

WARD PARKINSON: "We got on with the job, working literally day and night, precisely because we had limited funds. And we did not aim at niche markets, or up-market pricing, but at developing long-term relationships with customers

and selling at conventional prices.

"But, above all, we had a sense of urgency."

DOUG PITTMAN: "Inmos may perhaps have been late with its 64K dRAMs because initially they had concentrated on the static RAM business - an area in which they are doing quite well now. They may have wanted to become military suppliers for some reason. But in Paul Schroeder they had a brilliant designer - one of the best."

DENNIS WILSON: "I believe that Inmos may have underestimated the complexities involved in producing 64K dRAMs. It's a tough product area to crack."

Ward Parkinson

JENNIFER d'ABO'S SUNDAY TIMES

Jennifer Hammond-Maude started her career as Peter Cadbury's secretary. She then opened a grocery shop - Rob's Food Market. Today, as Jennifer d'Abo, she runs Rymans.

This year we've been spending most of our weekends at the flat in London...that is when we've not been abroad. It's been a terrible year for travelling.

I hate flying with a passionate loathing, my entire inside simply churns at the idea, but one just has to live with it.

In January we went round the world and since then I've been to Milan, Paris, Stockholm and Copenhagen. But when I'm at home my main occupations on a Sunday are reading and pottering around talking to the hordes of plants in the flat. Ideally I like to wake up as late as possible because I'm a very bad sleeper. Then I make a cup...no that's too refined...a mug of instant coffee and stay in bed reading the papers until as near lunchtime as I dare.

My husband, Robin, or one of the children generally go out to pick up the papers, but I like to get hold of them before Robin because he divides them up and leaves a trail of bits wherever he goes. They always look like a dog's dinner after he's finished with them.

If the children are about I'll drag myself up around 11.00 and start cooking. The kitchen is a very therapeutic place for me as I can mess about in there just as I like. But if we haven't got the children, we'll go off to a restaurant for lunch.

I hardly read the papers during the week, which leaves me appallingly ignorant of what's going on in the world, but I like The Sunday Times business section very much and always read it from cover to cover. I'm a great fan of the person who writes the leader in the business section...I do wish he were in Geoffrey Howe's job. Just when everyone else is sitting up saying the recession is finished, he

comes along and points out in a very nice way that it isn't.

Prufrock is good too, and I find the stories in the business section are much more informative and descriptive than the daily news in the financial press.

I also like the way they find some small business and write it up...it's very encouraging. When you start a business, there's so much to put you off, it's nice to read about something that goes right for a change. And people take note of what they read. There was a story once about a chap making furniture who was in difficulty because he'd been persuaded to move into a building too large for his business and we rang up to see if we could get together with him in some way. But he'd already had about 20 calls that Sunday morning from people offering to help or buy him out. The news in brief pieces and the bits of gossip on the lines of "watch this company" are also quite amusing.

One of the great things about Sunday is that it's the only day when the phones don't ring. I'm always nervous when they do as I think there may be something wrong with one of the children, so I associate Sunday with that freedom from the telephone and the relaxation I feel as a result.

In the afternoon I'm quite happy to curl up and read a book, or sometimes we go off to a video place in the Fulham Road that Robin's crazy about and come back to watch a new cassette. Otherwise we'll go for a walk.

There is also The Sunday Times crossword. Robin reads the whole paper and keeps it for two or three days, but I generally flip through the main news section and the crossword, which we attempt during the day as a joint effort. It's the only part of the review

that I turn to. When I was married to Peter Cadbury he was absolutely marvellous and would let me have a go at it before polishing it off himself. But I have got out of practice in the last seven years.

Like the rest of the day, the evening is, if all goes well, very quiet. After making supper, I'll go to bed early and read a book. Or perhaps see if I can finish off that crossword.

In a recent survey by the New Business Research Consortium, several interesting facts emerged:

◆ **The Sunday Times is read by more businessmen than any other newspaper.**

◆ **The Sunday Times is the only quality Sunday to have increased its businessmen's readership since 1980.**

◆ **The Sunday Times has market leadership in most of the important occupational areas, including: marketing, 43.5%; computing, 32.5%; finance and accounting, 38.5%.**

◆ **The Sunday Times has more readers in all the following categories: top income bracket, 51%; 2-car families, 36%; credit card ownership, 35%; value of shares £10,000+, 53%.**

Almost every indicator showed The Sunday Times to be the top paper for business men and women.

For more information about display advertising, phone Mike Ruda, Advertisement Director, Times

SUNDAY TIMES MAGAZINE Newspapers 01-837 1234.



More businessmen read The Sunday Times than any other newspaper.

THE SUNDAY TIMES

The accountant who sees red in grey images

THE audacity of the computer is that it recognises no stereotypes, respects no entrenched images, allows no dusty reverence for tradition.

The public image of accountants casts them as dull, grey people whose minds move in columns, who balance their laundry lists and audit their cornflakes.

Not so! The accountancy profession, seen by many as one of the last bastions of "staidism" is changing fast. And one of the elements of this change is the invasion of the computer into the hallowed huts of the auditor.

Ruf Perry, computer audit partner of Cooper & Lybrand, sees red every time anyone levels the "boring grey men" accusation at his profession.

"It's not like that," he storms. "This image of the accountant as a man with a funny walk, a John Cleese, is absolutely absurd."

"There are some very able people in the profession - very able, very flexible, very imaginative, quite radical in fact. Yet all of those are words that you would never normally hear associated with accountancy."

Perry believes vehemently in computer auditing, and he argues most persuasively for increasing involvement on the part of all accountants in this dynamic area. "Too many people see the audit as something static, that an opinion is an absolute thing. I've given my opinion on the accounts and that's that, I don't need to look any further - that's nonsense."

"The world is changing all the time and the client is moving to new techniques, using computers more and more, not only for accounting systems, but extending to the flow of all information within the organisation. The audit has to change to. And if we don't adapt we'll become less and less relevant."

It's not just accountants he's talking to. He claims that finance directors, lawyers, academics and data processing people should also get involved. "It's important for all those sort of people to understand, but particularly the DP people. If you're running a DP department you might need to know what controls are desirable and to what extent you should be audited."

Primarily of course the influence of computer auditing techniques is felt by two main groups - the auditors and the clients.

For the auditor the use of computer systems means that he can get much greater coverage of the data. You can examine much more information.

Perry paints a vivid picture. "Imagine a big company and all of the invoices for the whole year in lever arch files. They're marching across the walls - you've got wall to wall files full of invoices. Then

you say to someone - 'examine the purchases invoices for the year' - and that's what he does. He starts up there and he works his way round the wall."

Or up it. Just thinking about it is enough to "drive you straight off your trolley."

That which has ceased to become practical becomes almost easy with a program. We can write a program which says look at each purchase the company has made and analyse the variables. And because the data is recorded on electronic media the computer can work its way through all the invoices. It is the equivalent of weeks of work with lever arch files and a wet thumb.

Of course it is up to the auditor to define what he wants to look for. Perry says: "I, the auditor, have to define what I think is odd. Anything over a certain amount is possibly odd; anything with a discount outside the normal range is probably odd; anything dated 1985 is certainly odd."

Once the auditor has decided what would make him take a second look at an invoice, then the programmer can build those checks into his program. Given of course the basic premise that the data is stored by the company. So computers have revived the possibility of the 100% audit. The effectiveness of the audit is dramatically increased.

The computer can also be used to pull out statistics, to get an arithmetically reliable statistical sample. Not only the wet thumb, but also the rule of thumb, in audit terms, is facing doom.

The computer can reperform things which the company does, which the auditor has to check. Perry provides graphic examples. He conjures up images of auditors struggling to work balance sheet values backwards into stock figures, and vice versa. Programs permit rapid calculation across the whole stock population.

And then there's balance - that word beloved of accountants and behaviourists alike. Programs can check that files are in balance; that things are reported when they ought to be reported.

The other major benefit for the auditor is that he can begin to use the computer to take over some of the traditional load. Perry dismisses the days of "sifting auriferous piles of data; collecting pieces of paper, scribbling all over them and tucking them away in files. I can begin to do that on my own small computer." So the quill pen joins the growing scrap heap.

Then there's the host of future possibilities. "I can already, not very well yet, but I can begin to connect my small computer to the client's miniframe, and literally draw his data out into my own machine, and then manipulate it on my own machine."

It's easy to see that computers are bringing light into the life of the world's auditors. But what about the clients?

The benefit for the client is that he restrains the inevitable cost of

calation of his audit, as more people become more concerned about more aspects of his finances. Even junior clerks can be expensive when they're up to their ears in lever arch files.

Secondly, he benefits from the efficiencies which the auditor is able to bring to the audit. He gets more information; more valuable information; information he can actually use in a management context.

Perry talks about the client getting more "comfort" out of his audit. Does this mean the audit process becomes less of a "pain"? The simple answer is yes.

"The client feels more comfortable because more of his data has been examined. With a program that has scrutinised all the data, which couldn't previously be done, the client feels that his audit is more effective. He's happier."

Perry is a champion of the specialist in his area. "My view is that if you are going to be good you have got to have the best person at the table. If you are talking about auditing firms that are highly reliant on computers then you have got to have people who know their way around computers and how they affect auditing."

He admits that his views are not necessarily popular and that not everyone would agree with him. There are a lot of people who believe that there is no place for the specialist; that you just pass the knowledge down.

Perry counters that with the fact that that way "you never grow. You never develop the next stage. You need the dynamics of one man rolling skills down to the general practice and another man going off into the blue skies somewhere."

Having said that, essentially the message is "keep practicality in



PERRY... denies the "boring grey men" image of accountants.

computer auditing." Perry is very scathing about what he calls "doing the technological Oscar". He wants accountants to understand the down-to-earth uses (and abuses) of computers. He's not for converting his professional colleagues into DP experts.

He simply wants them to be able to answer questions like "To what extent do I need expertise in my business? What degree of skill do I need and why? If I have got to run software to be an effective auditor, what sort of person do I need to set it up? To run it?"

If all auditors can't be computer experts, and all computer experts can't be qualified accountants, at least, Perry would argue, they

should be working together. Like the song says - "The farmer and the cowman should be friends!"

Perry is only one of thousands of "computer age accountants." He believes passionately in the future of the computer auditing field and he will be propounding his views later this month at a three day conference entitled *Auditing in a Computer Environment*.

The Conference has been organised as a joint venture between the Institute of Chartered Accountants in England and Wales and the Institute of Chartered Accountants of Scotland.

Speakers from many of the leading accountancy firms, computer manufacturers, banks and

building societies will be "putting a practical perspective on a whole framework of computer and auditing".

Perry and his colleagues recognise that the audience will be largely accountants, but they are hoping for finance directors, lawyers, academics and DP people. Specially DP people.

The conference will take place on June 15-17 at the Inter-Continental Hotel in London. Further details can be obtained from the Institute of Chartered Accountants in England and Wales, Chartered Accountants' Hall, Moorgate Place, London EC2P 2B, telephone 01-628 7060.

IT CALLED ME AN INCOMPETENT BOBBY AND WALKED OUT!



How to make a Berk of yourself

PROGRESSIVE, radical and dynamic journals such as our own are always on the lookout for good schemes to back, exhibitions to mount and competitions to sponsor. In our ceaseless efforts to support the industry - and in search of favourable publicity.

Our latest brainwave: a competition to guess how many competing companies there are within a five-mile radius of the centre of Maidenhead.

There are only two little problems involved in the administration of such a world-shattering event. One is, how do we actually find out the answer for ourselves, other than by making the arduous pilgrimage and hoofing round the streets of Royal Berkshire?

The other: reward of any individual stupid enough to accept the challenge and follow in our footsteps.

Chad

ComputerWeekly

Quadrant House, Tito Quadrant, Sutton, Surrey SM2 5AS

Thursday, June 9, 1983

Don't let cowboys sell computers

THE legality of selling computers through authorised dealers is facing its first serious examination. The Office of Fair Trading is following up a complaint from a firm that wants to buy Acorn microcomputers from an official dealer and sell them to users. But Acorn threatens to strip dealers of their "authorised" status if they sell the products on to other firms.

Acorn's sales methods and this hard line against official dealers selling to other dealers are typical of those of other microcomputer manufacturers and main distributors.

But it appears that there could be a case against this way of working - at least as far as the law is concerned. The 1980 Competition Act gives the Office of Fair Trading powers to investigate "practices which prevent, restrict or distort competition in the supply or acquisition of goods or services in the UK".

By controlling the number and quality of their outlets, microcomputer suppliers could certainly be said to be preventing and restricting competition. They are therefore open to investigation by the Office of Fair Trading.

But in the microcomputer market "fair trading" for traders does not always mean fair trading for end user customers. Small businesses, seduced by the wide publicity given to the wonders of microcomputers by the mass media, can be easy meat for someone with a little computing knowledge, good sales technique and an eye for a quick buck.

If the system goes wrong, the customer might be stranded because the supplier has disappeared. In such cases, a good product, the manufacturer and the main distributor can get a bad name through no fault of their own.

If the Office of Fair Trading finds against Acorn, the company says it will fight back. Acorn is to be applauded for taking such a firm position right from the outset in this investigation. The industry has largely got rid of its cowboy image.

If Acorn loses, we could find the clock being turned back and the cowboys benefiting at the expense of the manufacturers and users.

Inmos' ray of hope

HALF of the Inmos top brass apparently turned up at the Newport, Wales, factory this week. Their concern was with the rumblings in the workforce about the possible closure of the plant, and complaints about the lack of technology transfer from Colorado Springs, Inmos' US base.

With chairman Malcolm Wilcox in the US rigorously looking for a quick fix before Inmos gets strapped for cash again, the cognoscenti talk of just one ray of sunshine on the Inmos horizon.

A sudden worldwide lack of chip production capacity, and the resultant rise in prices for such facilities, conceivably could help the UK government regain half of the taxpayers' money that has gone to finance Inmos. The word is out that the Colorado Springs plant could be up for sale, with three firm, potential buyers: two American and one Japanese.

But the reality of another June election brings another question to mind. It was in the immediate aftermath of that 1979 election that Inmos quickly exploited the post-election chaos and made a massive investment in real estate, which went way beyond the Inmos brief and proved probably the largest single factor in stunting Inmos' growth.

The British public deserves to be told in full what harrowing problems state participation in industry can generate if it is not properly controlled.

There are a few large items of expenditure though which seem to deserve scrutiny. Why did Inmos Corp pay \$350,000 to Austin Knight for a single year's recruitment campaign, if after the campaign it nominated staffers to top posts who had been with the company since 1978?

Why did Inmos Corp have to have so many premises simultaneously, when it had only a modest number of employees? What contractual obligations did the NEB take on a vis-a-vis the co-founders? The list is as long as your arm.

1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by John Fowling of Uxbridge, Middx, who wins £5.

In addition, there is a computer program to monitor people in the building. Shades of big brother. If anyone is in the wrong place, or should not be there, this is noted.

LETTERS

DEC's Darkcrest policy

SOME recent press reports have generated confusion about the court case between DEC and Darkcrest. This statement is for publication and is intended to clarify the issues.

- 1 The High Court on May 6, 1983, pending the final trial hearing, granted Digital's request for an order restraining Darkcrest from infringing copyright in Digital software and passing itself off as a Digital OEM able to trade in licensed software. Mr Justice Goffling said that Darkcrest has a substantial case to answer in respect of both copyright infringement and passing off.
- 2 Digital is bringing the case to full trial. No source in Digital

has said or implied the contrary. However, the defendants may of course decide to try to settle before then.

- 3 Digital's policy is to conduct court case only through the court, not the press. Unsubstantiated reports have been published which Digital has consistently refused to confirm or deny, preferring to allow the court to decide the issues. This position has been fully vindicated by the recent High Court decision.
- 4 Digital's software licensing arrangements are clear and worth restating after some confused reports. Digital does not sell its software. End users are granted a single

CPU licence only. Digital OEMs are granted a licence to make a single further copy and may license that copy for use on a single CPU.

- 5 Darkcrest does not have and never has had an OEM agreement with Digital and cannot legally license Digital software.
- 6 Digital will continue to protect its software copyrights with appropriate action. This is in the interests of genuine Digital OEMs, as well as end user customers, and is recognised as such throughout the industry.

M. R. PALLISER
Public Relations Manager
DEC Reading.

Stick to the facts

I OBJECT to this type of tatty advertising in *Computer Weekly*. I would have thought that copywriters and advertising managers might have grown out of this



nudge nudge wink wink stuff by now.

Please suggest to Omnis that potential customers would prefer a few useful facts and that they should enrol with a more up-to-date advertising company.

J. P. LAKE
Reading.

Forth and Lisp manuals are coming

AS one of the principal distributors of the Acornsoft range of books and software, we share the concern recently expressed through your columns over the lack of an adequate manual to accompany both the Forth and Lisp

cassettes produced by Acornsoft.

I am assured by Acornsoft that both the Forth and Lisp books are being printed and we expect to have copies available for distribution at the beginning of July.

Copies may be obtained from

booksellers, or in case of difficulty, please contact us direct. Both books will cost £7.50.

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10 YEARS AGO

FROM COMPUTER WEEKLY OF JUNE 7, 1973: Control Data Corp entered the floppy disc market with the launch of the 9400 flexible disc drive. Former Labour Minister of State at the Foreign Office, Lord Chalfont was appointed to the board of IBM UK Holdings. Pecten Corp of California named former executive vice-president of MDS, Ryal Poppa, as president. A base for UK operations was established in Surrey by US microcomputer manufacturer Modular Computer Systems.

Liveware File

by Don

I HAVE THIS IDEA THAT THE ONLY... EXCITEMENT LEFT IN THIS ELECTION... IS WHETHER THE ITN VIC BO... WILL GIVE BETTER GRAPHICS THAN THE BEEB'S SET-UP!

Five seconds and you've got a code

"WHAT is my post code?" I asked Gurukul Singh, co-founder of the small computer services company CAM (Centre for Analysis and Modelling), based in Watlington, Oxford. Singh fumbled with a terminal, and came up in about five seconds with the answer - pretty impressive when you consider that the computer had to search a database of 23 million addresses.

CAM deals in refined data, and the post code application is typical of what this £300,000 company does.

Businessmen can save money by finding out from CAM the post codes of clients. The Post Office gives discounts to companies that send letters bearing the correct post code. For a million letters the saving can be £37,500.

CAM specialises in financial modelling, and statistical analysis of large volumes of data. Most of its revenue is from consultancy for government departments, but the company has now launched a subsidiary, Pinpoint, to attack the commercial market.

The company's biggest exercise in data crunching was from the Department of the Environment. This was the analysis of informa-

tion supplied by a million homes in the National Dwelling and Housing Survey carried out in 1978.

CAM is still marketing statistical tables from this survey, in collaboration with the DoE and the Welsh Office. The DoE has direct access to the information by dialling up CAM's Digital Equipment Corp. computer, to perform more detailed analysis.

"It is not our job to analyse and draw conclusions," sighs Singh.

The survey gleaned information not taken by the more recent 1981 census. The housing survey gives more details of each home, and of the occupants, but unlike the census does not provide country of birth.

CAM's greatest success, notable for so small a company, was in winning the contract to perform the government's controversial rate calculations. The formula was changed in 1981 to the block grant system by which the rate support is allocated according to how much each council needs to spend, based on a weighting of "relevant" factors.

The contract for the rate support contract went by public tender to two US companies,

Geico and Comshare, in 1980. The system did not prove totally successful - last year the government had to step in with an extra £25 million for London to save Tory councils from face-reddening rate rises.

So this year the DoE deemed that the contract might as well go to a British company, and picked CAM.

Because of its unique access to databases of national geographic, social and economic data, the company is well placed to help with market analysis and selection of sales outlets. CAM recently helped Marks & Spencer pick the best site for a new store.

And the company offers a poster targeting system, which suggests where an advertiser should site a poster for the best impact. CAM developed this service by extracting data, including the position of drinking hostilities and other public places likely to attract poster gazers, from several regionally-based databases.

Another lucrative contract came from the City of Westminster to digitise existing maps of the sewer network. This speeds up the process of checking whether a



SINGH... "Not our job to analyse and draw conclusions".

sewer is safe before maintenance men descend into its bowels. It also makes it easier to examine the state of the sewers round a proposed development site for a big new building.

Singh is not one to vaunt his wares, and until this year shied away from the stage. "I've never sought publicity," he laments. But this, he admits, is not of the

highest wisdom, and this year is doing something about it. There is now the marketing arm, Pinpoint, and Singh is picking up commercial business, including a contract for a statistical analysis of policy holders from Abbey Life.

If Singh wants more publicity, he certainly made an impression on me. I got stuck in the lift coming down from his office.

Dye company that came from the red

LIKE many small textile companies, David Evans of Crayford fell into the red during the early months of the current recession. But unlike many others, the company is now back in profit - and congratulates its computer for the turn in fortune.

The problem was that the company has many small bespoke orders for silk ties, handkerchieves and scarves that need individual mixing of the many dyes. The process was wasteful and time-consuming because of the difficulty in working out how much of each of up to 80 primary dyes was needed to make up any of 350 different final colours.

The dye recipes are now stored on a Dragon microcomputer, and can be used to calculate accurately exactly how much dye is needed for each order.

There is also the problem that many of the primary dyes are incompatible, so that certain combinations cannot be used, even though in theory they would yield

the desired colour.

Two separate programs are run on the computer for each of two types of silk printing. One program is for straight printing on plain cloth. The other is for cloth that has already been dyed, when the final dye contains a reducing agent to remove the existing dye.

"We would like to merge the programs and do stock control at the same time," says company chemist Joe Green, who designed and wrote the programs.

Eventually the company hopes to have automatic mixing of dyes in a process similar to that used by some shops for mixing paints for interior decoration.

Encouraged by recent success, the company is branching into new fields. "We have just done a special silk square for the Royal Tournament and we do more and more promotional squares for companies, ranging from fashion, cosmetics and perfumes to whisky," says managing director Ronald Nutley.

Counting on savings

by Andrew Thomas

A CAD/CAM systems house is offering discounts of over 40% to educational users. Suffolk-based Counting House Computer Systems makes the offer to colleges and polytechnics on both software and peripherals.

And the savings could be even greater. US miniframework Prime is also offering substantial discounts to colleges and polytechnics, and it

is Prime hardware for which the Counting House products are designed.

The Counting House educational package, including software and peripherals, is now available for £32,000 compared with a list price of £53,000. The package includes the CAD Centre GNC and GDS software, two workstations, a plotter and a paper tape reader/punch.

IBM sites make false training economies

MANY IBM mainframe sites are making false economies at training of development staff. The result is high salaries and management costs, and fast staff turnover.

This is one conclusion of a survey, Applications Development in Practice, Another finding from the 33 sites surveyed is that the average applications backlog is 147 man years. This means priority projects are unlikely to start until 1987 when they are probably defunct.

And talking of man years, they are thrown away each year on projects. This is worth £300,000 a year if you cost a man at £200 including salary, office space and machine time.

What the survey fails to do is how much money would be saved if these unwanted projects were completed. Or how much it would cost to employ enough systems designers to avoid the false trails.

Recruitment and training is a way to cut applications backlog. DP managers estimate that to recruit costs them over £3,000 agency fees and advertising expenses, but they expect to get less than £250 per person per year on training. This limits the number of suitably trained people and means that as demand increases, their cost will rise.

The report says: "Users' reluctance to spend very much on training will contribute little to expanding the supply of quality personnel."

The survey looked at other ways of reducing backlogs. Only 10 of the sites use software house development staff to supplement in-house development. For use of contract staff, accounting for 10% of development effort, the sites use software houses, which represents 11% of their development effort.

Getting end users to develop their own applications is another way to reduce backlogs.

DP managers estimated that 30% of developments could potentially be done by end users, but they did not seem keen on the idea. The report says: "Despite recognising the potential scope of end user computing, respondents were not overtly enthusiastic about it - perhaps as a consequence of professional territorialism."

Structured methods were ranked last out of seven possible methods of improving development productivity, and one manager dismissed them as being suitable only for staff of "poor ability".

*Applications Development in Practice, Xephon Technology Transfer Ltd, King House, King Street, Maidenhead SL6 1LE.

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A more intelligent approach to playing computer chess

CHESSE can be played on most leading micros by running in a program from cassette, or alternatively can be played at a higher level on a dedicated chess-playing computer.

But the trouble with most chess computers is that they cannot be upgraded to take advantage of new programs that take a more intelligent approach, or look more moves ahead.

This problem has now been solved with a new machine called Conchess. The secret is to have just two ingredients: a chess board

and a specially designed replaceable cartridge which contains both the software, or chess program, and the microprocessor. In this way the chess board can always be upgraded with more powerful cartridges so that, in theory at least, it need never be replaced.

In common with other chess machines, Conchess offers ten playing levels, the top level being well above average club standard - and the middle levels sufficient to beat you and me.

Again, like other chess computers, Conchess is best at the middle

game, when the number of possible moves is least, so the computer can make a more exhaustive examination of the possibilities.

Conchess is distributed in the UK by London-based Contemporary Chess Computers. All models have a fully automatic sensory device, so you play in the normal way simply by picking up the desired piece, and plunking it down on the most appropriate square.

The computer indicates its move by lighting up two squares - the one it wants to move to, and the one it wants to move from.

'Don't worry - I'm a friendly word processor'

by Nuala Moran

NOT all extra-terrestrial beings are friendly. But what about word processors? If anyone has any doubts, then Manpower, the temporary services agency, has a training programme to take the fear out of failures to the art of word processing.

Trained with use purpose-designed discs which run on the WP system itself. According to Man-

power these are "friendly" and "comforting". For example, "Hello, I'm your Displaywriter and I'm going to help you learn how to use me. Don't worry you can't hurt me. I'm one message that comes up on the screen."

It is all part of Manpower's temporary word processing services package. Skillsware, which was launched at the International Word Processing Exhibition in

Wembley last week. It aims to select, test and train temporary WP operators to cope with systems from Wang, IBM, ABS, Philips and Xerox.

There are not enough WP operators trained to work these systems. This means that an organisation such as Manpower can either retain workers with experience on another WP system, or train someone who

Manpower developed Skillsware to do this as painlessly as possible, on the basis of a £3.5 million research and development programme involving staff and customers in the USA, Canada, Japan and the UK.

Skillsware offers operator proficiency tests specific to the WP system the operator is trained on. The variety of jobs a WP operator carries out are described by application and function charts and skill levels are given to each task according to the same criteria as the proficiency tests - basic, intermediate, advanced.

Workplace is compiled by Philip Hunter.



And now, the award for outstanding achievement in the development of software for the trophy-making industry.

PUZZLER FIFTEEN FIFTY SEVENTY

GIVEN the fact that SEVENTY is an even number, can you work out the addition sum hidden in this alphabetic. See page 71 for solution.

The North of England's own computer systems, peripherals and software exhibition...

COMPEC NORTH '83

Belle Vue, Manchester.
June 21-23, 1983.

If your company owns or is thinking of buying a computer, visit COMPEC NORTH '83, the only exhibition in the North of England for serious computer users and DP professionals.

On show will be mini- and micro-computers, small business systems, software, printers, terminals, other peripherals, telecommunications equipment and word processors. This exhibition offers you an unequalled opportunity to meet and discuss with the experts, hardware and software best suited to your company's requirements.

Opening times are: Tuesday June 21, 10am-6pm
Wednesday June 22, 10am-6pm
Thursday June 23, 10am-4.30pm

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COMPUTASTARS SECOND REGIONAL HEAT

Commercial Union tops men's teams

WELL, we didn't come last, but we had a damned good try. Computer Weekly's very own Computastars team did little to dispel the commonly-held beliefs about journalists' physical prowess. But enough of object failure: on with the show.

Something was seriously wrong with the weather. The sun was shining and a warm breeze caressed the Computastars pennants at Enfield on Sunday as the 25 male and 10 female teams prepared to do battle. And what better to start the proceedings on a hot day than heaving a heavy medicine ball about?

The first of a string of good showings from Bank of America number one Vernon Turner helped his team shove an early lead with Commercial Union. Bank of America's women's team matched its male counterpart's performance, pulling out a six-point lead over second-placed Commercial Union.

Steady optimism in the Computer Weekly camp (equal third from last) was dashed in the hockey dribbling by a miserable last place. Commercial Union showed how it should be done, taking first place from the Inland Revenue team.

Legal & General's women started a run of four first places in the hockey, beating Commercial Union and Centre File into joint second place. Sandra Upshall of Barclays International put up the best women's individual performance, with Tony Jones of Codex leading the men.

In the standing long jump a splendid effort from Barclays International 1 left no doubt about its standing orders. The same week attempt at humour could also be applied to Bank of America number one Vernon Turner, who won the individual event. A double first for Legal & General's women's team and number one

Anne Bragg saw its lead over Commercial Union extended.

Then it was the turn of the team sprints - the last event before lunch. A three-way tie saw British Aerospace 2, Centre File 1 and first time entrant Hartley Cooper sharing 45 points each. This position was mirrored in the individual scores, as Steve Skelton, Stuart Aylott and Horace White also tied for first place.

In the women's section it was again Anne Bragg and Legal &

General who topped the individual scores, as Steve Skelton, Stuart Aylott and Horace White also tied for first place.

Small unit Hartley Cooper won the team event, and its number one, Steve Skelton, the individual. Legal & General and Anne Bragg bounced back and the women's individual lead changed hands again.

Last event of the day was the ever-popular 1600 metres relay. This time it was the turn of the men from Legal & General to match the splendid form displayed by their female counterparts, winning the team event. Number one Tony Tripp took the individual

honour.

Back with the women, Legal & General finished a terrific day with another pair of firsts, taking the team title by a 57-point margin, and Anne Bragg beat Ailsa White by just nine.

Commercial Union, who had led all day, beat Bank of America into second place, but in the men's individual we had that rarest of occurrences, a tie. Both Vernon Turner and Steve Skelton scored 95 points, and shared the trophy.

By some quirk of fate, Computer Weekly picked up enough points in the last event to beat Coda by two points. Perhaps the gallant sportsmen of Coda felt sorry for us. We may never know.

And so it was that Inland Revenue scored its first and only

Revenge score in this first and only

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Centre File's Horace White prepares and lands in the long jump.



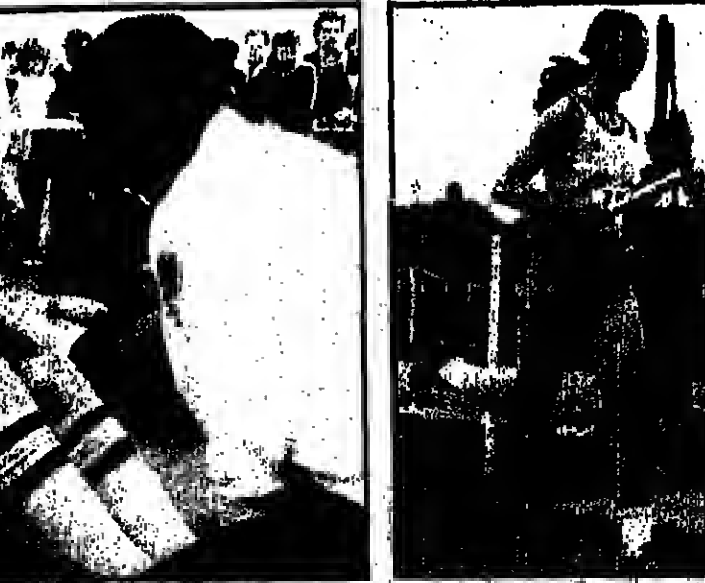
Microscope tried extra hard, with its managing director urging them on.



John Donohoe looks pleased with his performance in the 1600 metres.



Commercial Union's Graham King sits up, and down, and up.



Anne Bragg - five first places.



EPS Consultants collected their own trophy during the 1600 metres.

MEN'S TEAMS		Points		Total	
Rank	Name				
1	Commercial Union	34	34	31	255
2	Bank of America I	34	31	28	224
3	First Aero 2 Kingston	28	22	33	233
4	Hartley Cooper	22	20	26	228
5	Centre File 1	19	18	27	218
6	Barclays Internat I	27	28	35	218
7	Brit Aero Bristol	18	27	39	205
8	Legal & General	24	24	20	204
9	Brit Aero 1 Kingston	31	23	25	203
10	Centre File 2	20	26	11	202
11	Scotvac	18	24	23	205
12	EPS Consultants	23	30	19	191
13	Logica VTS	24	23	27	191
14	Bank of America	27	18	31	191
15	Logica I	27	18	31	191
16	Bedfordshire CC	26	32	10	186
17	Irving Trust	16	23	25	174
18	Inland Revenue	18	33	15	174
19	Barclays Int	23	24	21	170
20	Codex	13	20	27	159
21	Microscope	18	20	29	157
22	Systime	17	22	9	148
23	Microscope	26	30	12	138
24	Computer Weekly	10	18	9	118
25	Coda	28	17	9	115

S denotes a small unit entry; V a veteran team.

MEN'S INDIVIDUAL		Points		Total	
Rank	Name				
1	Vernon Turner	15	7	14	95
2	Steve Skelton	10	8	11	95
3	Graham King	11	10	13	85
4	Stuart Aylott	11	6	10	82
5	Graham Howell	6	7	13	73
6	Horace White	9	15	11	73
7	Tony Tripp	10	8	9	71
8	Paul Brough	12	9	10	70
9	Joe Camacho	12	9	10	70
10	Jon Morgan	7	5	12	69
11	Keith Johnson	10	13	8	68
12	Craig Willocks	6	6	12	65
13	Phil Edge	6	6	8	65
14	Vernon	9	7	13	65
15	Mike Carrington	7	7	6	59
16	Tony James	3	14	5	58
17	Teoy Jones	2	15	4	57
18	John Donohoe	5	7	6	54
19	Vernon	9	6	7	54
20	Roland Lewis	1	8	13	50
21	Alex Barnes	4	9	2	47
22	Roger Albury	6	4	6	43
23	Vernon	8	11	6	41
24	Chris Lennon	9	4	3	35

WOMEN'S TEAMS		Points		Total	
Rank	Name				
1	Legal & General	24	33	45	286
2	Commercial Union	30	28	27	229
3	Bank of America	36	28	23	215
4	Centre File	26	29	31	214
5	Bank & Research SVS	20	25	27	193
6	Microscope	22	24	21	186
7	Codex	16	16	12	148
8	Barclays Internat	9	36	21	146
9	Superior	17	14	22	139
10	EPS Consultants	20	6	21	97

WOMEN'S INDIVIDUAL		Points		Total	
Rank	Name				
1	Anne Bragg	10	13	15	105
2	Ailsa White	15	14	14	96
3	Jane Holmes	13	10	11	86
4	Sandra Turner	10	10	11	81
5	Jane Dawson	9	10	13	77
6	Sandra Upshall	11	15	11	66
7	Sara Jarman	6	7	10	66
8	Lynn Pearce	8	3	8	54
9	Christine Lee	3	5	9	44
10	Linda Krillo	6	2	10	37

Events (left to right): Medicine ball throwing, hockey, standing long jump, team sprints, 1600 metres, football, 10 up, 1600 metre relay. Sprung by Commodore Computer.



Panorama Office Systems, the new British company which is developing the "Personal Typing Centre" to be launched later this year, has announced its senior management team. Left to right are: Alan Ogilvie, director of development and engineering; Michael Kennedy, director of marketing; Terry Cooke-Davis, managing director; and (seated) Robin Smith, director of finance, who is shown demonstrating the Personal Typing Centre. PTC combines the functions of a typewriter and word processor and will, according to an optimistic Cooke-Davis, "mark the revival of the British typewriter industry."

■ HAL Computers has appointed Bob Spanton as technical support manager. He was previously in a similar job with Eaton Semi-Conductor Equipment.

■ Ferranti GTE, the new high-technology telecommunications company, has appointed Mike Almond as manufacturing director. He was formerly with the management consultancy Collinson Grant Consultants.

■ Anderson Jacobson has formed a business computer division and appointed Lloyd Collins formerly with Rair, as Ajile sales manager. Ajile is Anderson Jacobson's portable 16-bit microcomputer.

■ Megabyte, the Leeds-based computer supplier and a subsidiary of the Associated British Engineering Group, has announced the following board appointments: Tony Burgin as managing director, Mark Whittle as financial director, Chris Simpson as software director and David Sanders as sales director. Burgin was previously the company's sales manager. Whittle has been promoted from financial controller. Simpson was previously software manager, and Sanders joined the company a year ago as special accounts executive.

■ Prime Computer has appointed Richard Williams as vice-president Europe, Middle East and Africa Marketing Operations. He joins Prime after eleven years as an international senior executive with IBM.



■ Burroughs Machines has appointed Major General William Allen (above) as director of training at the company's new residential training college at Milton Keynes. The £10 million college is in the final stages of construction and will open in early 1984. Allen is currently director general of Army Transport and Movement. Previous appointments include that of Assistant Commandant at the Royal Academy of Sandhurst, where he was responsible for the overall administrative control and training function for the students at the Academy.



■ Koy Clayton, (above) has been appointed manager for Safe Computing's Micro-SaFeS production control system, controlling all sales, dealer training and support for the product in the UK. Based in Leicester, she was formerly part of the Micro-SaFeS support team and is experienced in both programming and production management. Former companies include Serek Controls, Unibra, Forward Trust and KRS Computer Services.

■ Microm-Borer has appointed a new sales team for its recently opened office in Knutsford, Cheshire. The team is headed by Bernard Durkan, Northern region sales manager. Durkan joined the company from the independent software house IPS. David Thompson has been appointed sales executive to cover the North East of England and Scotland. He joins Microm-Borer from Burroughs where he spent four years as a sales executive. Brian Little has been appointed sales executive to cover the Midlands. He joins from Case.

■ Brian Cudby has been appointed general manager of Duocsa Branson Contract Services, a new company set up within the Duocsa Branson software services group to supply contract support staff - principally for banking and financial computing projects - through a "Top 100 register". The company is head-quartered in a new London office opened by Duocsa Branson at Wilco House, 228 City Road, EC1Y 2BJ. Cudby joins Duocsa Branson from BS Software Ltd, where he was operations director.



■ Dr Paul Auton (above) will take over as managing director of Cambridge Consultants in July. For the past six years he has been deputy managing director and, for most of that period, has been responsible for the operation of CCL's contract development business and the company's personnel policies. Before joining Cambridge Consultants in 1969, he worked on lasers and semiconductor devices at the Marconi Research Laboratories.

DIARY

JUNE 13
Tomorrow's staff - where are they now? IDPM Norfolk branch. Castle Hotel, Castle Meadow, Norwich. 7.30.

JUNE 15
SERC's software technology initiative. BCS Software Engineering Group, Chemistry Theatre, Birkbeck College, Malet Street, London. 10.50. Admission: BCS members £1, non-members £2.

JUNE 16
Visit to Hewlett-Packard, Hertfordshire. BCS West Herts branch. Details from Peter Greaves on 01-623 5222.

JUNE 22
The office of the future. BCS Sussex branch. King and Queen

Meeting Room, Marlborough Place, Brighton. 7.30.

JUNE 23
Prime user conference. Bloomsbury Crest Hotel, London. Contact Roy Bulmer on Warrington 35953 Ext 2619 P.

SEPTEMBER 14
The Ada programming environment by Dr Valerie Downes, Imperial College. BCS Bristol branch.

SEPTEMBER 19-21
APL Business Technology 81. BCS APL User Group, Loughborough University of Technology. Details from BCS headquarters.

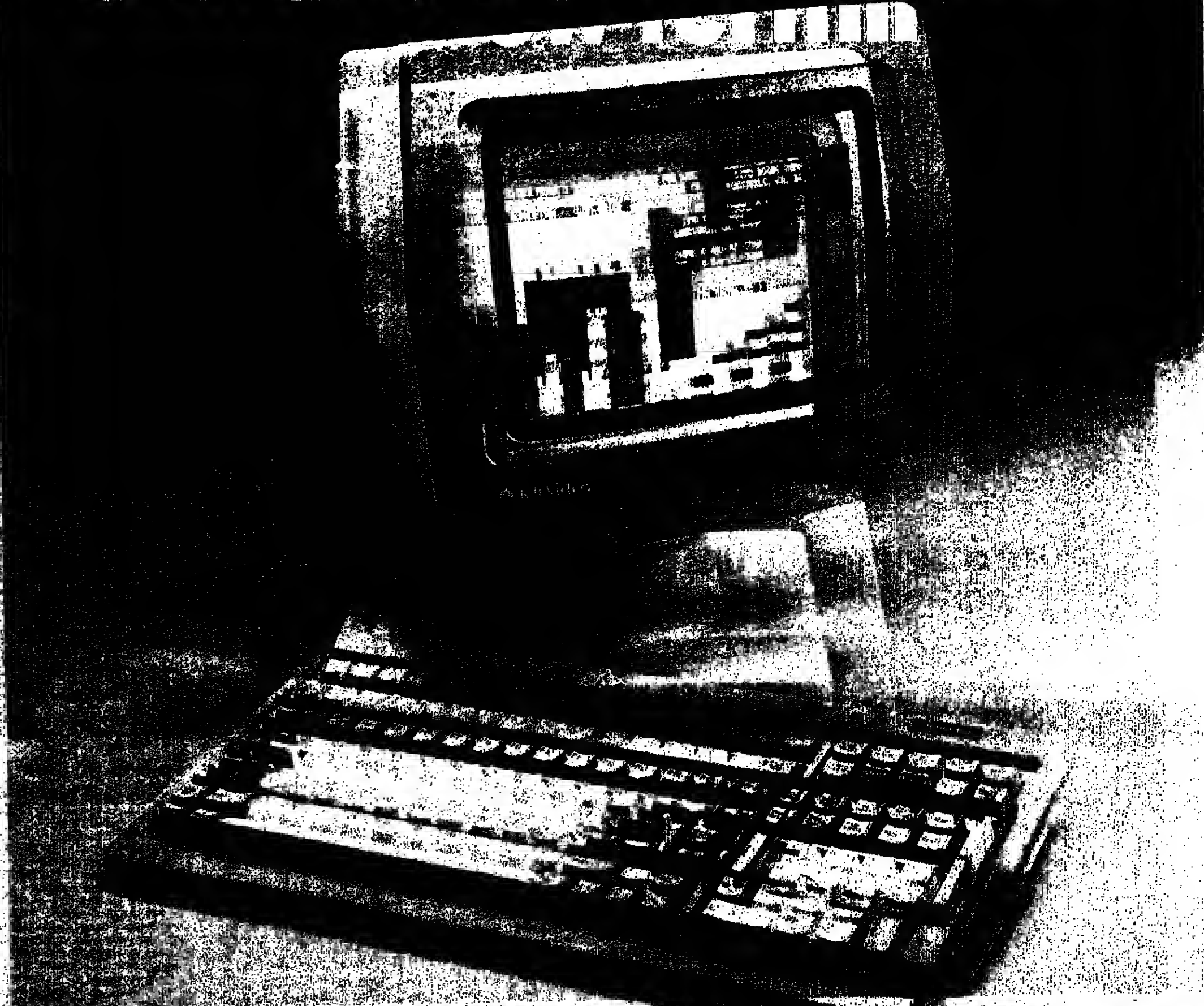
SEPTEMBER 19-21
IFIP Congress 83. BCS, Paris, France. Details from Peter Wainman, BCS headquarters.

CONFERENCES

■ **BLEASDALE** Computer Systems is expanding its range of courses on Unix and "C". The following two courses are now being offered. Unix for Managers - this one-day course is designed to give an understanding of the Unix software system and the developments both in hardware and software. "C" Programming Standards is a two-day course which supplements the company's three day course on the same subject. This advanced course deals with the standards which should be adopted when producing programs in "C" together with the program development facilities offered by Unix. Course dates: Unix for Managers: June 23, July 21 and September 22. "C" Programming Standards: June 20-21 and September 19-20. Details: 01-828 6667.

■ **THE** newly-formed independent Association of Authorized Digital Computer Distributors (IDEC) is planning a conference for October this year. IDEC currently meets each month for members to discuss subjects of mutual interest in their dealings with Digital, and the conference is seen as a focus for major issues of the present and future. Digital will be invited to take part in an exchange of ideas at the conference, which is seen as a potentially important milestone in relations between IDEC members and the company. On June 17 Dr. Eric Haworth, IDEC's chairman, will be visiting America for talks with Digital Authorized Distributors and Digital itself, and he will be inviting guest speakers from the US to the conference. Details on IDEC from Dr. Haworth on (061) 246 7100.

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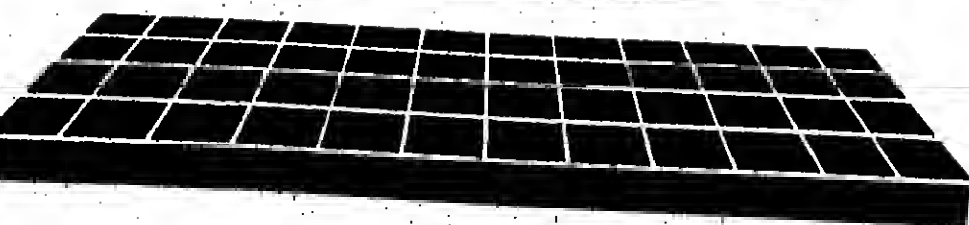
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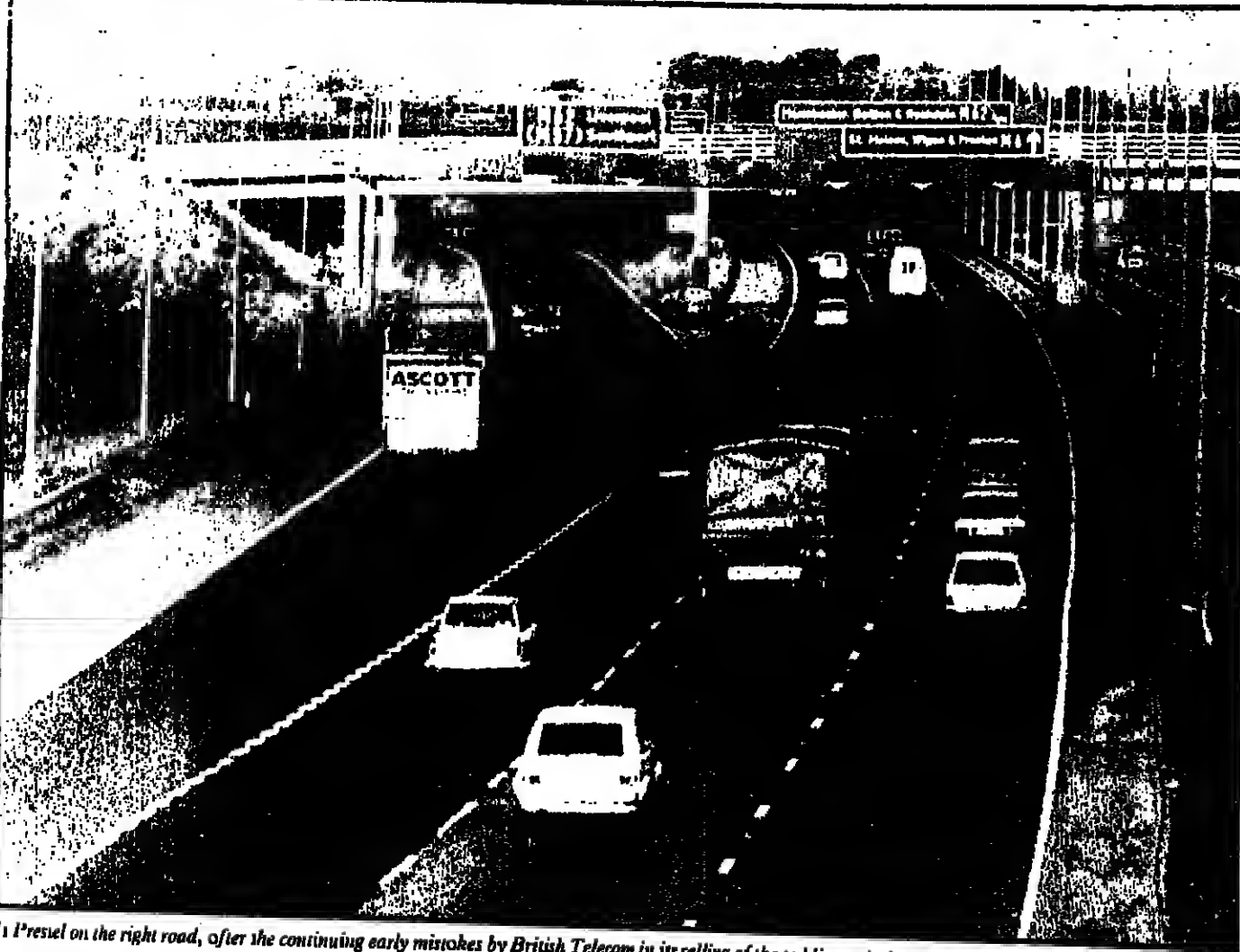
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For more information contact: The Exhibition Sales Manager The Computer Trade Show, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Telephone: 01-561 3125

The sponsors and organisers of this event are all members of Business Press International Ltd.

01-561 3125

This six-page feature opens with an assessment by Peter Sommer of the 'horrendous' attrition rate of Prestel IPs



11 Prestel on the right road, after the continuing early mistakes by British Telecom in its telling of the public service?

Does Prestel know where it's going?

MORE than 70% of all organisations that have attempted to be Prestel Information Providers (IPs) since the start of the public service in September 1979 are no longer in that business.

At any one time the number of main IPs has been around 150 to 160; but a rapid survey of old Prestel directories shows that well over 400 companies and organisations have, in the last four years, signed direct contracts with British Telecom, ending them to a three-digit code on the system, blank pages and editing facilities.

Another survey, this time of the monthly tables of accesses to each database, gives a crude idea of levels of activity. High scorers of even two years ago like Link House, IPC and Eastel are today not even on the system, and some of today's top scorers had yet to appear.

A few IPs have undoubtedly made real, though small profits, but most, including some of the longest-serving and those with the highest access scores, have not.

Even by the standards of new ventures in new industries, the attrition rate continues to be horrendous. The usual "explanation" is to blame all on BT's initial mis-marketing.

A closer examination of the careers of various IP ventures shows that the consequences of the early extravagant optimism about the rate of uptake in the residential

market were substantially over by early 1981.

Failures later than that must be attributed to two things: IP inadequacy and continuing mistakes by BT in its selling of Prestel.

From its inception, Prestel was an oddball for BT (to simplify I will refer to organisations by their present names and not historic ones like the Post Office and Viewdata).

BT treated it as a test-bed for the managerial device of the independent profit centre within BT (since widely adopted as BT prepares itself for privatisation and competition) and no monopoly was claimed over the technology.

As it was handed over from the technical research team that had developed it to the marketing group that was to launch it, a debate took place within BT. One should argue that the product should have an entire integrated range of database service plus the technical resources to deliver and service them.

This view lost out to the "common carrier" school which said that BT should merely provide the means of distribution and that commercial enterprise and market forces would see to the rest.

Prestel's early IPs were persuaded on the promise of the technology — the fact that they were in at the beginning of something that might become important — and on BT's famous forecasts.

In under a year the failure of the forecasts was apparent, as was the whole BT strategy simply to leap about enthusiastically and hope that "take off" would happen (the metaphor of the period was a jumbo jet getting up power on a runway).

BT produced a new marketing plan in November 1980 which switched the emphasis on to specific business applications.

IPs who arrived on the scene at this point or since, or even those pioneers who persisted but with modified plans, should have had no doubt about what they were letting themselves in for.

Some information providers have complained that particular Prestel officials displayed an unfortunate mix of arrogance, commercial ignorance and clumsiness in handling their affairs. In the last few weeks it looks as though senior BT officials have become aware of the dangerously low ebb of IP morale and a modified marketing team is currently issuing soothing noises.

The process of attrition is not over. Although most information providers now properly understand that they are not in the computer business, but in a form of publishing, it will be several years before the industry is sufficiently mature and stable for investment and managerial decisions to be reduced to a series of basic formulae in the way that's possible in print publishing. There will be more withdrawals; more umbrella IPs will collapse leaving sub-IPs stranded; and there will be some consolidations and takeovers.

The cost of useful market research was (and is) daunting. But without it the serious money for investment and advertising will not be forthcoming. To take just one huge unanswered question — always supposing residential videotex will come: do users want very generalised information, as so teletext, very particular information as is suggested by every trend in consumer magazine publishing, or will there be little requirement for either, and the emphasis be on teleshopping and telebanking?

Four years on and we still know very little more.

Individual organisations began to learn the economics of videotex publishing: Prestel fees account for less than 10% of your actual costs; even editing equipment is not expensive. You spend most of your money on office overheads, staff, marketing — and information gathering.

For a large conglomerate the opportunities for self-deception about costs are enormous. Because so many of the elements are intangible it is difficult to be maintained, you can only run an IP operation if you have an adequate turnover of product.

And from this last understanding came the justification for the umbrella IP, the "professional" quasi-bureau that sells a mix of sub-let pages, editing resources and consultancy.

While the number of main IPs has remained constant over the last four years, the sub-IPs, less than 100 to begin with, now exceed 1,000.

About 85% of all information pages on Prestel now arrive courtesy of an umbrella IP. Well over two-thirds of today's IPs are umbrellas of one sort or another, with around 40 principally in that business. Three years ago there were less than 10.

Umbrella IPs too, can fail; several have done so in the last 12 months, some spectacularly. The umbrella business has attracted poor financial managers, poor marketers, over-enthusiastic self-deceiving entrepreneurs. There have even been one or two crooks.

For the large diversified publishing group supporting a videotex division there has been one further hazard: the industry is volatile and difficult to get an immediate grip of. Fostering an innovative unit among a series of well-established, carefully disciplined, orthodox profit centres is a daunting task for top management. A number have simply given up.

The process of attrition is not over. Although most IPs now properly understand that they are not in the computer business, but in a form of publishing, it will be several years before the industry is sufficiently mature and stable for investment and managerial decisions to be reduced to a series of basic formulae in the way that's possible in print publishing.

British Telecom itself is still struggling to understand what it is selling. In the middle of last year it

returned to the debate it had had the outset: common carrier versus managed database.

This time the winner was a managed database, the individual elements to be produced by a series of joint ventures or the award of franchises.

Starting out with such spoglio one thing: introducing it in a established common carrier environment where you have great expectations in and have legal obligations towards your existing clients is another.

Further, a policy of managed databases implies that BT had understood about database publishing and marketing. You need to know about such things even if you intend doing is reviewing tenders from third parties to do it.

Of the current crop of such ventures only Micronet is an admitted success. Club 403, a West Midlands residential database, is an experiment rather than a commercial exercise. Homelink, the Nottingham Building Society telebanking service, has started much more slowly than was promised.

In the last few months many IPs have been complaining that Prestel has disastrously changed its style: they say it no longer discusses its plans with the IP community as a whole or keeps them warned about new system developments like the availability of service at local rates.

Some IPs have also complained that particular Prestel officials displayed an unfortunate mix of arrogance, commercial ignorance and clumsiness in handling their affairs. In the last few weeks it looks as though senior BT officials have become aware of the dangerously low ebb of IP morale and a modified marketing team is currently issuing soothing noises.

At this moment BT is about to lose a critical asset it has had from the beginning: ownership of the system that offers the one place number that answers all queries. Prestel will become merely one of a series of public videotex facilities for publishers/vendor and user alike. The arguments for public-private become ever more attractive.

Why do IPs carry on, why, indeed, does British Telecom? The answer is the technology is still full of astonishing potential. For all the ineptness of Prestel's marketing (though there have been notable exceptions) and the clumsiness of some IPs, videotex as a technology works. It is now genuinely cheap at every level and by every measure, it is truly mass-market. It is easy to use; it delivers today what people think cable may deliver in ten years' time and it is robust.

The prizes are as tantalising as ever.

Peter Sommer runs the specialist financial electronic publishing house LOTC and is also senior consultant of AVS Intext, the Prestel umbrella IP, systems house and consultancy. The views expressed here are his own.

VIDEOTEX

Fight is on for the domestic market

Owen Ashcroft describes British Telecom's three-pronged strategy

PRESTEL, the public viewdata service of British Telecom, is entering a new phase which, paradoxically, looks like taking it back nearer to the ambitions of its creators in the mid-1970s.

For five years business users took the lion's share of the service, and home users represented only 10% of the total. The number of home users is now over 5,000 and they represent 20% of new registrations, which are now around 1,000 a month.

Prestel executives are firmly committed to speed the growth of domestic Prestel usage, aided by staff of the Department of Industry responsible for boosting the UK's information technology industry.

In February 1982 British Telecom, the DoI and representatives of the equipment makers' organisations met to discuss ways of enabling Prestel to emulate the success of broadcast videotex. They discussed ways of designing and presenting the database and the interactive facilities inherent in the service, and the most acceptable ways of charging for them.

Three needs are being emphasised: those of particular interest groups in all parts of the UK; those of particular chosen localities; and those related to groups of linked domestic needs.

The service for a particular interest group is Micronet 800, which was developed by Prestel and Microcot (BMAP, Telemap, ECG Publications and Prism Microproducts). Users of micros are offered a 50,000-page Prestel

newspaper group. Viewtel 202 is claimed to be the world's first electronic newspaper on the public Prestel service. There is special news coverage for the Club 403 areas, available on the Club database, and several other Prestel information providers are working with Viewtel on the database, to produce material of interest to people in the locality.

A major feature of Club 403 is the interactive facility of viewdata. Wherever possible, all the providers use response frames, including service providers, such as stores and other businesses, local community service organisations, and several national and international organisations who see the project as a valuable test bed for the impact of interactive facilities on their operations.

The response frames enable subscribers to order goods, take advantage of special offers, send for brochures or seek more information. At the launch in late March there were already more than 50 service providers offering key-in ordering facilities and 200 more offering follow-up details and brochures.

Club 403, which is sponsored by the DoI, Viewtel Services and Prestel, believes that its battle for public awareness is largely won and that the time has come for a hard sell drive to recruit subscribers. The charge is £4 a month for the full Club database, plus local telephone call rates for access time.

The service is sold through TV rental and retail outlets. Staff of these outlets attend demonstra-

"We need answers to two key questions: 'Why will a family acquire a Prestel set?' and 'Why will they use it regularly?' The price, the technology and the promotional strategy are secondary to the product. The information and transaction package must be right to attract and hold the attention of home users"

closed-user-group database of news, information, product advice, etc, and they also get the benefits of Telesoftware, which enables them to download microcomputer programs from Microcot via the Prestel network, and run them on their home micros.

For personal computer users, the interface with Micronet enables subscribers to become members of a family able to access a database of over 250,000 pages.

It is significant that, within a month of the Microcot launch, when only users of the BBC Micro could link into the service, over 1,000 micros signed up for membership. Within eight weeks, nearly 2,000 had signed up.

Now that users of the Commodore Pet range and the Tandy TRS80 can link in (with Apple, Sinclair and RML models following), good progress is being made toward the target of 100,000 members for Micronet by March 1986.

(Incidentally, the National Computing Centre is developing a series of business software packages for the launch in September of Business Micronet.)

The first Prestel service for a particular locality is Club 403, in the West Midlands, serving at first the Solihull, Sutton Coldfield and Edgbaston districts, where it is being advertised and promoted vigorously.

The Club database is managed — and largely provided — by Prestel's leading information provider, Viewtel Services, part of the Birmingham Post & Mail

group. Comet, Trident, Thomas Cook, W. H. Smith's mail order and book clubs, Telefon and Teledisc.

Among the first subscribers were solicitors, accountants, estate agents and insurance brokers — all people who deal with mortgage applications. They were offered the free loan of an A/N Prestel Adaptor — the Homelink — supplied by Tandata, and were required to have an investment of at least £10,000 in NBS.

Mass recruitment starts on July 1, when anyone in reach of Prestel can access Homelink via a free loan Homelink adaptor for their existing TV set, in return for a £4,000 investment in an NBS ordinary share account. Alternatively a £2,000 investment earns mem-

bership at a fee of £2 a month. Enquiries about the project have been received from almost every country in the world and it is claimed that the system is a revolution in financial operations.

Homelink, Club 403 and Micronet are co-operating to ensure that they are compatible rather than competitive.

Summing up the Prestel attitude, British Telecom's Richard Hooper said: "We need answers to two key questions: 'Why will a family acquire a Prestel set?' and 'Why will they use it regularly?' The price, the technology and the promotional strategy are secondary to the product. The information and transaction package must be right to attract and hold the attention of home users."



Just to prove that Prestel has some viewers — even though it's not perfect.

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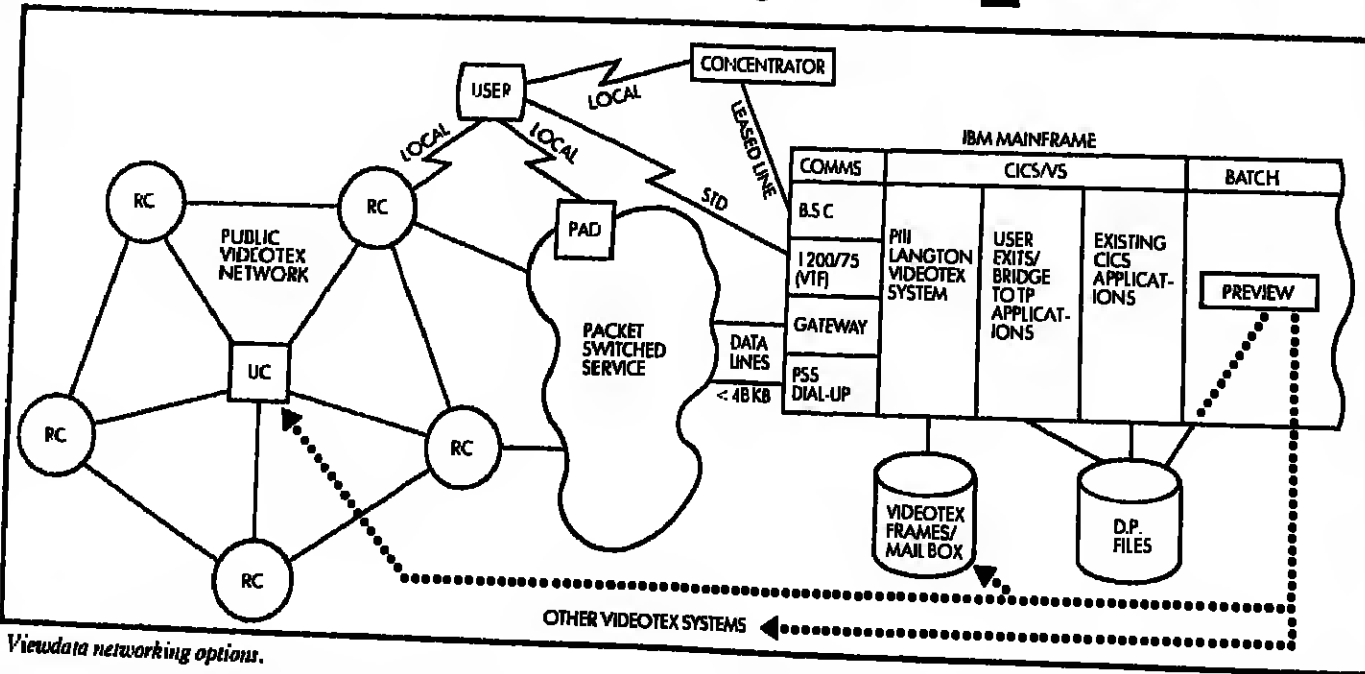
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OFFICIAL

Some see it as an opportunity, some as a threat. But viewdata will have an increasing impact, says Barry Ashdown

Viewdata—the liberator that does away with computer mystique?



Viewdata networking options.

VIEWDATA with its attractive and inexpensive terminal, easy communications and simple use, is now becoming well established. In the past two years about 150 private viewdata systems have been installed in the UK and increasingly these are being integrated into normal data processing.

The original viewdata concept is typified by Prestel, the British public viewdata service. The viewdata frames are stored on disc in their final display format and each allows the user to branch to 10 other frames by making a simple menu selection.

However, the static database is not applicable to transaction oriented business applications. Here real time viewdata is required so that viewdata frames can be made up dynamically against user requests. This may be achieved by reformatting VDU screens from 80 character monochrome to 40 character colour or by accessing DP files and storing the results in viewdata frame masks.

The reality is that most business applications would use both static and dynamic frames. The static frames will be used for noticing down to the chosen application and for general instructions, notice boards etc. The dynamic frames will then be created in response to commands from the user.

These commands are likely to take the form of completing fields within a data collection frame.

A number of other features go to make up a viewdata system: Data collection where viewdata is being used to create a batch transaction file for overnight processing; the mailbox feature which allows the system operator or individual user to send messages to one or more other users (the mailbox on some systems is so good that it competes favourably against some free standing electronic mail products); electronic notice boards, notepads and diary systems.

Powerful system management functions are provided including security control, system performance and usage statistics. These sorts of features are now standard on most viewdata systems.

But for all its advanced features, viewdata is really all about communications. The two options most often considered are direct dial and Prestel Gateway, but a number of other options are available.

Direct Dial uses ordinary PSTN speech lines to connect either directly into the viewdata system or via local or remote concentrators. The use of remote concentrators will be determined by any existing network, the geographic coverage required and expected traffic flows. Each concentrator could support up to 32 viewdata ports and would be connected to the viewdata system by leased line.

Another current option is to use the Packet Switched Service (PSS). Each PAD (Packet Assembler/Disassembler) on the network already supports the connection of viewdata terminals at 1200/75 bps. As part of the PAD log-on process,

the user selects the mode of operation. Usually this would be to define an enter key which is used to terminate each packet and send it through the network.

It is also possible to work in character mode (very inefficient) or with a timer which sends off the packet when no key strokes have been detected for a defined interval.

Looking to the future we can see cable as an exciting delivery mechanism for viewdata. The enormous bandwidth of cable means that alpha photographic television quality pictures (Picture Prestel) can be delivered almost instantly, compared with the several minutes it takes to send the same information through the telephone system. Links between viewdata and other communications networks like telex and teletex can also be expected.

The Prestel Gateway service which started in 1982 has opened up some interesting networking possibilities. Prestel allows local call access to over 60% of businesses and homes in the UK and this is planned to increase to 90% over the next few years.

By connecting a private viewdata system into this network it is possible to avoid the high STD telephone charges incurred by out-

of-town users. However, this facility is not free.

The Gateway service has been available in Germany on the Bildschirmtext system for two years, and most of the German companies involved in this service have connected their mainframes directly on to Gateway. Some are using the packet switched service while others are using BSC leased lines to a Bildschirmtext FEP.

In the UK the packet switched service is the only option.

The viewdata market in the UK is divided between mainframe and mini-based solutions. To date the majority of installed systems have used the minicomputer, often acting as a front end processor to the mainframe.

A couple of years ago, it looked as if everyone would go this route. It is certainly attractive to buy a dedicated applications mini that can be installed and operational in a few days.

However, there is now evidence of a revival in the fortunes of mainframe viewdata systems. It removes the need for the minicomputer with its attendant costs, different operating system and support requirements. Then there is growth potential in terms of the number of users that can be connected in the system at one time. As the capacity of one minicom-

puter is exceeded there is a need for additional hardware with problems of networking and maintaining concurrency of the databases.

Another indicator leaning towards the mainframe approach is that transaction based systems require a reasonable CPU to support them.

As soon as it is necessary to execute sizeable programs in support of each frame that each user accesses then, clearly, CPU power becomes an important factor in the argument. The mainframe has plenty of computer power and is the machine on which the data files are held.

Looking to the future it seems likely that mini-based systems will be used best where it is possible to answer most of the questions on the mini itself. This may be using a traditional database or real time frame made up from DP files held on the mini. Where applications require a high level of interaction with mainframe files then the mainframe viewdata system is probably better.

As one user said: "You are going to have the traffic on the mainframe anyway so what is the mini contributing?"

When considering Gateway we have to look at set-up costs, traffic charges and performance considerations. The set-up costs will vary considerably depending on the host computer and the number of components already in place. As a general guideline, a budget of £100,000 should be allocated if starting from scratch.

The Gateway software costs between £10,000 and £50,000 and to this you may have to add the cost of a minicomputer if the front end processor approach is preferred. In any case X.25 communications will have to be acquired. The Prestel Gateway licence is £3,000 a year, and some frames will be required on Prestel. This may be another £1,000 or so a year from an umbrella organisation or £5,000+ a year if you wish to be a full Prestel information provider. The Data-line connecting into the PSS network is typically £800 to connect and £3,300 rental a year for a 9600 bps Dateline. This should support up to 32 concurrent users.

Adding staff costs to the above, it is clear that Gateway is not cheap to implement - so what are the benefits?

Prestel Gateway is a value added network service. Firstly it provides

a single port of call (usually local rate) for any user who can then be onward routed to the various Gateway computers. This is important for communicating with the public who would not normally dial into a private system and also for businesses like high street travel agents who need to connect to dozens of tour operators, airlines and reservation services.

Prestel also provides network management with duplicated

information that is valuable to the ultimate user and should be acceptable.

Another application would be the holiday trade, which would show the latest availability on Prestel and/or the private viewdata system while allowing access to the real time reservation system for order processing. Most Gateway applications are going to use two or three of the components described.

VIA (the Viewdata Industry Association) has produced an excellent booklet, *Prestel Gateway Cost Effectiveness*, which will be an invaluable guide when planning the first application using this technology.

It is up to you whether you consider viewdata as a threat, an opportunity or just plain irrelevant. However, it is unlikely to go away and the ubiquitous viewdata terminal is going to be connected to more and more computers as time goes by. The easy viewdata protocols and attractive display will give computer access to an audience much larger than anything we are used to.

Viewdata could be the data liberator that will remove the mystique from computers for once and for all.

Barry Ashdown is software product manager of Langton Information Systems.

to the viewdata system - perhaps, some further checks, followed by a response time determined by such factors as the priority given to the application and other activity on the machine.

There is typically only a few seconds delay but longer response times are not unknown. The time of information retrieval or transaction processing on the mainframe will be cutting applications dependent. For the sake of argument, costs of 10 or 20 pence per minute are not too far from the mark.

Viewdata storage costs are highest at the front of the system - Prestel. But the usage charges are quite the reverse with the highest premium coming with the use of the mainframe. As viewdata offers much larger audience access, information it becomes essential to answer the user query at the earliest possible point in the system.

To use the processing power of the mainframe to dynamically format frames of frequently used static information can be very efficient.

An application such as a railway timetable demonstrates how to get the best from such a system. The most commonly accessed data would be the inter-city timetables and they would be stored as ready-made frames on the Prestel system. This would allow for instant access at minimum cost without requiring large amounts of storage.

The next level of data would be the timetable covering major towns. This would be held as ready-made frames on the private viewdata system. It may not be more than a 100,000 frames, but disc space is relatively cheap and the additional PSS charge and delay should be acceptable.

The third level of data is the which defies re-formatting; the ability to produce a timetable between any pair of stations in the UK. This clearly needs reference to the master files and would have to go through a real time timetabling program having established the departure and arrival points required. This may take up to half a minute to process and carry a considerable cost. However, it is

considerable cost. However, it is

It is up to you whether you consider viewdata as a threat, an opportunity or just plain irrelevant. However, it is unlikely to go away and the ubiquitous viewdata terminal is going to be connected to more and more computers as time goes by. The easy viewdata protocols and attractive display will give computer access to an audience much larger than anything we are used to

systems, user registration and billing.

Moving on to the operational considerations, we get some interesting usage figures which will influence the way the system is implemented.

Prestel charges £5 for each frame stored on the system and 5p per minute connect charge during prime shift whether accessing frames stored on Prestel or passing through the Gateway link.

The PSS charges amount to about one-third of a penny for each data frame retrieved and about 1p for each data collection frame sent to the user (system improvements will reduce the figure later this year).

These PSS charges are billed to the Gateway customer who may decide to use the Prestel charging structure to pass these costs on to the user. In addition to the cost of the Gateway link we also have to consider the time delay. The initial connection could typically take five or six seconds, while each frame access may be delayed by two or three seconds.

The final link in the chain is the private viewdata system which may be on the mainframe or a front end processor. Again there will be a time delay in passing back information to the user. For example, there will be the log-on

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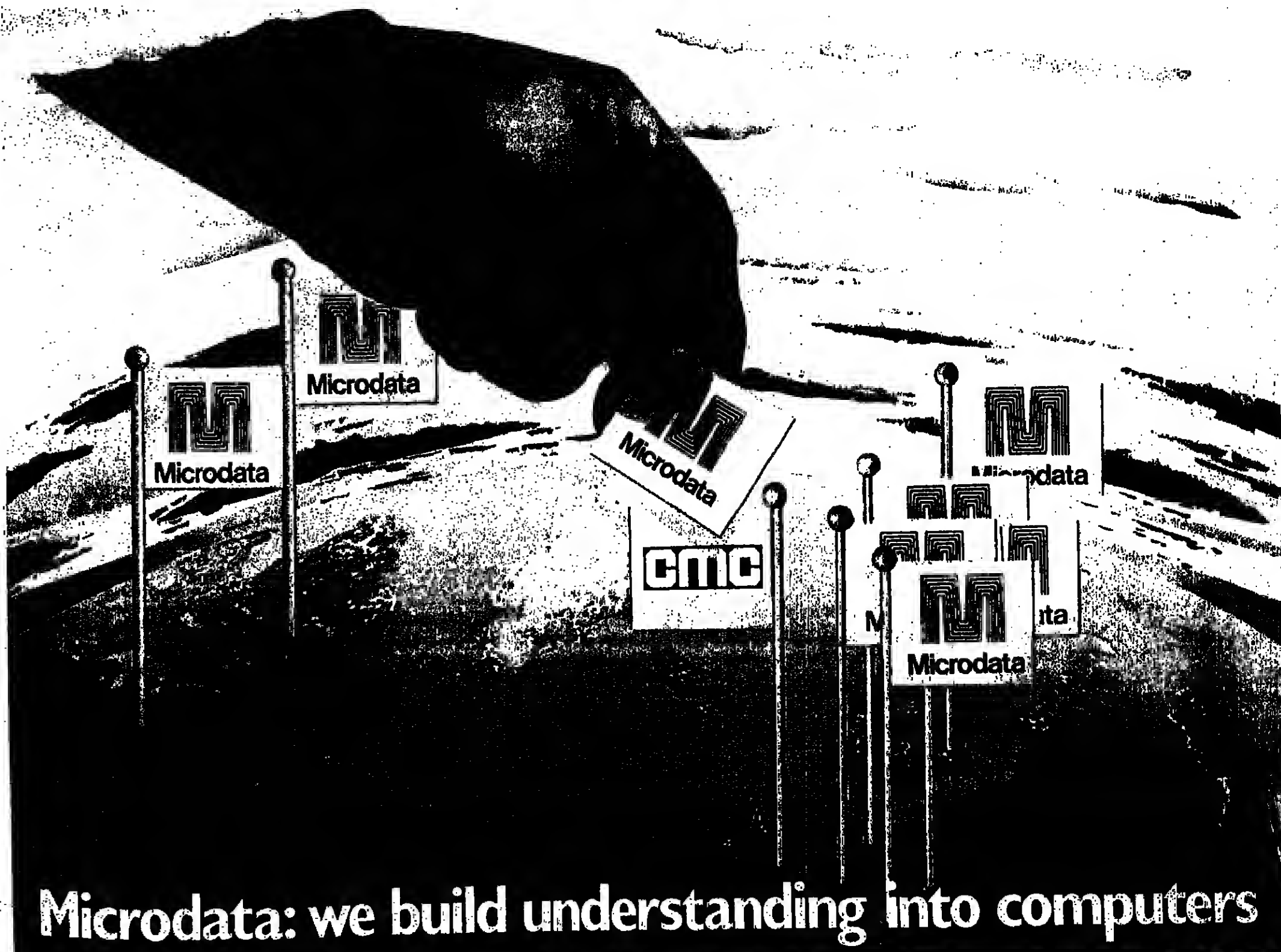
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VIDEOTEX



Boris Sedacca meets somebody who could be Prestel's saviour

The man who wants to get 100,000 new users on to Prestel

WHEN British Telecom launched Prestel as a domestic videodata service, the aim was to make it simple enough for anyone to use.

But despite this obvious advantage, the total Prestel package was marketed so unattractively to domestic users by BT that, over the years, the service had come to be regarded as something of a white elephant.

British Telecom's impending privatisation and the liberalisation of telecommunications has forced BT to become more aggressive in getting more users on to the service.

HEASE...
"Eventually I continued"

on BT's three-point strategy (page 23) shows.

One lesson which had to be learnt in that technically-oriented users are more likely to be at the leading edge of any mass market which might materialise for Prestel.

The high turnover of Information Providers struggling to make their Prestel information service pay from a small number of subscribers began to worry BT. After four years of operation there were still only 20,000 users on Prestel.

So when a plan was presented to BT to get 100,000 new users over the next three years, its first reaction was sceptical.

When I approached Richard Hooper of Prestel and said 'How would you like to get 100,000 new users on to Prestel', his reply was 'Go on, pull the other one'. But I eventually convinced him my idea was sound," says Richard Hease, managing director of Micronet 800.

Micronet 800 allows microcomputer users to load software into their machines by logging on to Prestel.

Hease's brainchild came about when East Midlands Allied Press set up its computer publishing division. The company had a subsidiary called Telemap which provided Prestel information on gardening and motor-cycling.

EMAP directors told Hease to investigate Telemap and to decide whether to close it down or make it

Advertisers on Micronet pay rates from £100 a year for a single page to £50 a page for over 50 pages, while special positions are charged at higher rates.

Users can of course send electronic "mailshots" free of charge, but Hease argues that once the receiving users have seen it, they can flush it from their "mailboxes", whereas paid advertising cannot be erased by anyone other than the advertiser.

The first phase of Micronet is aimed at the home and education market, and at certain target machines in particular: the BBC Micro, Tandy's Models I and II, the Commodore Pet 3000, 4000, and 5000, the Sinclair Spectrum and ZX81, the Apple II, and Research Machines' range.

The main problem of connecting micros to Prestel is that they all have different display formats. Special interfaces have to be built. For example, the Sinclair Spectrum has to be converted from its standard 32-column format to Prestel's 40 columns and this can only be done with high resolution graphics.

Hease called in Seicon to do the job. "We had previously used a number of small software houses, but it became obvious we needed to get professionals in because time-tables were slipping and documentation was not being produced. It's worth paying the extra money to get the job done properly."

If Micronet succeeds in its ambitious aim to get 100,000 users by March, 1986, it will have gone a long way to becoming the saviour of Prestel, despite British Telecom

work. "At the same time I was looking at teleconferencing as an alternative software publishing medium to conventional magazines, and also at problems of accessing information from databases."

"The first problem we had to crack was to get Prestel's co-operation. The second problem was to make access cheap enough for users. We ditched the other Telemap activities to concentrate on database access."

Some of Micronet's funding comes from a Department of Industry grant of £250,000 over two years, and also from Prestel in the form of resources worth £500,000 for technical development personnel for loading teleconferencing, and for pages on Prestel.

Micronet's revenues will come from three sources: subscriptions, software sales, and advertising. A subscription costs the user £1 a week for a minimum of one year, billed quarterly by British Telecom.

For this he gets free access to the Micronet database and a range of free software comprising about 100 programmes. Educational establishments are encouraged to display programs written by students and teachers for use by other subscribers.

A "mailbox" service allows users to exchange messages, accessible only with the correct password by the recipient.

The second source of revenue, chargeable software, allows subscribers to load in and save programs. About 50 programs at about £50 each are available from Micronet.

COMPANY PROFILE

Kevin Cahill reports on a breakthrough in semiconductor technology — and the men who made it happen

Superchip gives Trilogy the lead over IBM

AMERICA'S newest mainframe manufacturer, the Trilogy Corporation, created a sensation recently when it demonstrated the chip at the heart of its new machine.

Conceived jointly by Trilogy's founders Dr Gene Amdahl and his son Carl Amdahl, the chip, a wafer level implementation of chip technology, contains, according to Carl Amdahl, "several million components."

This makes the Trilogy chip the biggest semiconductor device ever made.

The standard reference for components on a chip is Hewlett-Packard's 32-bit processor on a chip, which contains about 500,000 components. The Trilogy chip is 6cm square and has about three times as many active components as the H-P chip.

Normally a wafer contains several chips, and wafer level chips have not been attempted because of state-of-the-art limitations on device interconnects and controls.

According to Dr Gene Amdahl, the basic Trilogy machine will contain about 30 of the Trilogy chips, implemented in emitter coupled logic and water-cooled. The move to water cooling marks a major technical shift for Dr Amdahl, whose name has long been associated with the generation of air-cooled Amdahl Corp (and Fujitsu) machines. Before that he was the architect of IBM's 360 range.

The Trilogy chip is water-cooled by a hand-sized cooling module, moulded in molybdenum, serviced by a cooling unit little bigger than an average family fridge. The Trilogy itself will be a little bigger than a Vax 11/780 while delivering, from the uniprocessor, a speed of 30-50 million instructions per second.

This is 40% faster than IBM's current 3084 quadri-processor, and is expected to be at least 100% faster than the uniprocessor version of IBM's Sierra successor to the 308X range, which is to be announced later this year or early next year.

Dr Amdahl makes comparisons only between what IBM is currently offering, and what he has achieved with the pilot Trilogy device completed almost two years ago. But Peter Lahe, a computer industry expert at New York brokers Smith Barney Upham, has said that, for its Sierra series, IBM will almost certainly have to move from transistor-to-transistor logic emitted coupled logic, if the main Sierra uniprocessor is to achieve the roughly 17 mips performance predicted for it by IBM watchers.

The chip technology devised by Trilogy as the foundation for its new series of machines may be

Cupertino to talk about licences.

Already managers from DEC, Nixdorf, Burroughs and Honeywell have visited the plant. So far only Cii Honeywell Bull, the financially stricken French computer company which was an original investor in Trilogy, has a formal agreement to use the new technology. And there are no indications whether Cii will take up its option, partly because of uncertainty about its own future, but the licences are not exclusive, so others will be free to bid for them.

This raises an intriguing question about Nixdorf. Last September Heinz Nixdorf, the firm's chairman and an investor in Amdahl Corp when Dr Amdahl founded it, said he would not be investing in his old friend Gene Amdahl this time around. His reason, he said, was that Nixdorf did not want to be seen as a potential mainframe vendor.

The Trilogy is expected on the market in early 1985 and sales prospects are good. But the firm may make more money out of licences for its semiconductors than from the Trilogy itself

However, Nixdorf made his comments before anything was known, publicly or privately, about the revolution in semiconductor technology achieved by the Amdahls.

Since the beginning of this year a bevy of Nixdorf senior managers have visited Cupertino, and there is an unconfirmed story that Nixdorf's original \$6 million investment in Amdahl Corp turned into an exit profit of \$60 million.

It was predictable that the first announcement from Trilogy would be about a semiconductor. Dr Amdahl is one of the most skilled integrated circuit engineers in the US. One of the reasons he left IBM was because of a dispute over the use of integration in circuitry for IBM's machines.

IBM's policy was to seek a technology that would fit all its machines, big and small.

Dr Amdahl believed big and small machines needed different forms of integration. He went on to use large scale integration in the Amdahl 470 series, while IBM stuck with intermediate integration and has since fallen further and further back in the technology stakes compared with Dr Amdahl.

Now, in his greatest challenge yet to IBM, Dr Amdahl, in partnership with his son, who is leading the design team at Trilogy, has produced a thermal cooled module many times more advanced than anything from IBM.

Typically, IBM's TCM has about 100 chips, each with about 600 logic gates. It functions by connecting the chips to each other in a complicated and expensive series of ceramic substrates.

As a recent report from the Gartner Group points out, IBM's TCMs were expensive to develop and took a long time to appear. Trilogy's TCMs, by contrast, have taken only two years to develop, and cost \$160 million to get into test manufacture.

According to recent testimony in the Hitachi case, IBM employs



Dr Gene Amdahl (left) and his son Carl, founders of the pioneering company Trilogy.

3,500 people in its mainframe labs, and launches, on average, a new mainframe architecture about every five years.

Industry commentators agree that 3,500 researchers must cost at least \$250 million a year, which adds up to \$1.2 billion for each new IBM mainframe development. This contrasts with the 400 people who have put Trilogy on the edge of manufacturing a 45,000 gate TCM with more than 1,000 pin connections. The huge substrate, which has acted as a major barrier to would-be competitors to IBM, because of the cost of development, has been swept aside by the Trilogy team.

There has been one snag, however, which troubles Dr Amdahl — that is semiconductor delays, which have now accumulated to a total of six months and have moved first shipments back from late 1984 to early 1985. And costs have run ahead of the budget.

Ted White recently wrote to the partnership that provided \$55 million of the original \$160 million, advising it that more money would be needed. This should not surprise the investors, who were warned in the prospectus that Trilogy was trying something that had not been tried before and might not work.

Dr Amdahl says there is still plenty of risk involved, but that the hardest part of the development is probably now over. Some of the investors who have been contacted seem very sanguine.

One suggested that anyone who had not allowed for at least as much again as the original \$160 million, which was earmarked to develop only the prototype, was not being realistic.

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This investor put the cost of financing the first year's shipments at around \$100 million, with about \$140 million to bridge the gap between prototype and manufacturing stages. This is slightly more than a Japanese estimate of \$300 million for a new mainframe, with which Dr Amdahl concurred in an interview late last year.

The Gartner Group, which recently issued an update on Trilogy, gave an estimate of \$250 million for further development at the company. In any case, \$400 million is small compared with the \$1 billion of sales that the Gartner Group says Trilogy could attract by 1986. And that doesn't include revenue from the new computer-aided design technology that Trilogy has used to get the huge chip built. Dr Amdahl says the company will sell this alongside the semiconductor technology, provided there is no competitive risk.

That Trilogy is bringing out its product at the beginning of a new IBM mainframe cycle is taken as a good omen by the Gartner Group, which points out that past successes of plug compatible vendors have usually been greatest when IBM customers were being forced to consider changes by IBM itself.

The Amdahl Corp achieved its greatest success when it was

offering only 50% better performance than IBM. On that basis the Amdahl Corp achieved a market share of 11.8% when it first shipped its product in 1976, and 22.5% the following year. The market for IBM compatible mainframes in 1985 is estimated at \$7 billion and Trilogy is aiming for a little over 5% of this in the first year — a modest aim in relation to previous Amdahl Group performance.

As one observer notes: "This time Gene Amdahl does not have to prove anything, just deliver." When interviewed Dr Amdahl conceded, with a smile that the original purchasers of Amdahl Corp machines deserved medals. The Amdahl Corp machine was the first IBM compatible machine ever delivered or even conceived.

There was some more good news for Trilogy recently when Datamation published the results of its annual survey of IBM users' buying plans. Of the 3,000 users who responded to the survey, 64% claimed unfamiliarity with the Trilogy product, which is hardly surprising, as most of the publicity Trilogy has had so far has been in the UK Press, and the company has not advertised. But 5% of the sample said they would consider a Trilogy purchase. Among 3033 and 308X class users the response was even more positive: 17% said they were interested and only 24% indicated no interest in the new machine and 59% of users were unfamiliar with it.

Among Amdahl Corp users the news for Trilogy was even better: 34% said they were interested; 20% had no interest and 46% were unfamiliar with the product.

With more than a year to go before the formal definition of the Trilogy series, although it is known it will include a 100 mips vector processor, seasoned market researchers say there is a better than even chance that the first year's sales targets will be met. The likely price of a Trilogy machine is in the region of \$4.3 to \$4.7 million, while the cost of an IBM Sierra is expected to be about \$5.2 million.

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Choosing computers to compete with the banks

Societies plan to share automated teller terminals . . . Boris Sedacca reports

IN the past building societies have been the main source of house mortgages. They have imagined that the mortgage market was theirs almost by divine right.

Recently, however, the banks, led by Lloyds and Barclays, have become aggressive rivals to them.

"The outcome of this sudden burst of aggressive competition from the banks has undoubtedly benefited the consumer," says Leonard Wilson, assistant general manager at the Anglia Building Society.

"The building societies have had to pull their socks up and to bring about a marked improvement in the speed and quality of their service. The mortgage competition from the banks has therefore rejuvenated the building societies into doing a much better

job for their own customers."

In a typical English high street there is usually one building society branch for every two banks. "The branch office is the most powerful piece of marketing mechanism available to a building society. The Sixties and Seventies saw tremendous growth in building society branch expansion," explains Wilson.

"This has now stopped because of oversaturation in many key areas of population, intensity of competition in a contracting market, the rising cost of maintaining marginal offices and changes in customer behaviour.

"New business growth in the Eighties is likely to come from the intensive cultivation of existing customer bases rather than territo-

rial expansion," Wilson contends.

Building societies are a particularly British institution. The main strength of a building society is the simple way it functions. The law allows a building society to do only two things: to borrow funds, mainly from personal savings, and to lend those funds on the security of bricks and mortar, mainly private houses. Little is lent on commercial premises, so there is virtually no risk.

With banks, market power is very concentrated. In 1969/70 there were two important bank mergers, which reduced the number of top clearing banks from six to four. NatWest, Barclays, Midland and Lloyds now have 70% or more of bank sterling deposits.

But the building societies are following a similar trend. In 1960 the top two building societies' market share was 57%. By 1980 this was increased by a series of mergers to 71%, and the projected market share for 1990 is expected to be at least 90%.

Anglia is the seventh largest. In July 1978 the largest building society merger took place between Anglia and the Hastings & Thanet Building Society, and in April of this year, it merged with the London and South of England Building Society.

In less than five years its assets have grown over two-and-a-half times to £3.2 billion and it has 400 branches and 700 agency offices.

To meet the competition from banks and deal with the increasing number of their branches, building societies are buying more com-

puters.

Anglia recently placed an order worth £10 million with the German computer manufacturer Nixdorf to install Nixdorf 8864 banking terminals at 300 branches.

The installation will include front office terminals for over-the-counter transactions and passbook updating, as well as back office enquiry terminals with text processing facilities.

The software has been written by Nixdorf to allow the equipment to interface with Anglia's existing equipment, and to link with the society's ICL mainframe in Northampton, which uses the ICL CO3 synchronous communications protocol.

"We considered about 30 different manufacturers worldwide," said Wilson. "With the growth we have experienced and all the pressures it brings in its wake, there was a strong temptation to

ties are considering setting up their own network, with their names on the cards.

Meanwhile, developments in the role of building societies and the possibility of wider services may lead to more use of computer technology and the training staff in new skills and expertise.

"The question of staff training is an important factor," says Wilson. "What we are not going to do is put in a machine and say 'The first phase will take place from June to December this year, and because we will be sorting out our merger we are talking in single figures, the project should be completed by the next two years.'

"We expect to install four or five counter terminals in a busy office as well as one or two office terminals. On average we

With the growth we have experienced and all the pressures it brings in its wake, there was a strong temptation to take short cuts in our computer department programme. This temptation was firmly resisted and after two years of painstaking planning and research we placed our order for the Nixdorf 8864 system

take short cuts in our computer development programme. This temptation was firmly resisted and after two years of painstaking planning and research we placed our order for the Nixdorf 8864 system."

Wilson hopes that by sharing automated teller terminals with other building societies, they will compete more effectively with the banks. Lloyds is the market leader with 40% of the wall ATMs, and NatWest plans to have 1,000 by the end of 1983.

Last year NatWest and Midland announced that they are planning to link their ATMs to allow customers to draw cash from the terminals of either bank. Barclays and Lloyds announced similar plans in March this year. But the schemes are not yet in operation.

"I do not think it will be easy for banks to agree on the use of shared ATMs," said Wilson. "NatWest and Midland are still sorting out compatibility issues. I am surprised at all these announcements about shared bank ATMs, because in the past they have pulled away from reciprocal arrangements for cashing cheques by imposing charges on customers of competing banks for the service."

"Traffic will have to be monitored carefully because I think the last thing Barclays wants is whole queues of Lloyds customers using their machines."

No single building society would have the resources to match such a network, nor would a building society wish to link up with the banks' network, because the banks would lose on a bank's name appearing on the card.

As Wilson puts it: "It is rather crucial that we would not be promoting the name of a competing bank as the building society."

than three terminals will be installed in a branch office.

"Building societies in many ways are not unlike football clubs. The strong competitive urge stimulates us to want to play in Division I. If we do not perform well we get relegation to Division II. If we perform well we get promotion."

"So the name of the game in the 1980s is really one of survival. Those building societies who do not hold their place in the top tier will be those not only financially but also in the face of increasing competition."

Wilson

"The building societies have had to pull their socks up

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SOFTWARE MONTH

Are expert systems in warfare a strength to be savoured — or are they just rigid reflections of man's weaknesses?

Has man made the supreme folly in his own image?

SOFTWARE controls the major defence systems of the world, but should it? Current software capabilities are responsive rather than deductive. That is, the computer is capable only of responding to a given situation and is not capable of reasoning about that situation.

Many people see this as a weakness since it tends towards a black and white attitude, a go and don't go: push the button or don't push it.

These people see the strengths of the computer lying in its phenomenal computational speed, and its tireless accuracy; its weakness is the inability to reason.

Man's weakness, conversely, is in his accuracy and his stamina; while his strength is in his deductive powers.

This leads to a peculiar choice: put very crudely our defence systems may either be placed in the hands of an accurate but unreasoning (in the literal sense of the word) machine, or in the hands of a reasoning but very fallible human being.

The acceptability of this choice is now being questioned, and the new concepts of expert or knowledge based systems are beginning to be applied to the formulation of military software.

The dangers inherent to the existing software, and the demands placed on future artificial intelligence are very neatly summarised in a report by Goodman and Brown: *Artificial Intelligence Applied to C.I.* (C.I. in military terms, stands for Command, Control, Communications and Intelligence).

Control centre staffs are hard pressed to meet command requirements and hardware and software systems designed to support intelligence analysts are pushed to their limits.

As more sophisticated sensor systems now in development come online, and the types of problems to be solved become more complex, control centre performance is almost sure to drop below the levels necessary to maintain an adequate battle advantage.

Extensive research and development efforts are providing some relief in the form of new and advanced computer systems for support of C.I. centre personnel. But most, if not all, of these systems are now, and will continue to be, critically dependent on highly trained operators with specialised experience.

As these new systems come into use throughout the military command structure, a new kind of limitation will be imposed by hardware and software but by the cognitive limits of the personnel available to operate them. As decision aids, computers must

function as more than just information storage, retrieval, computation, and display systems.

Future computer programs must supplement the human ability for using general knowledge to respond effectively in real time, emulate and follow human reasoning processes, acquire and apply knowledge, manipulate and communicate ideas, and focus attention (processing power) on relevant information.

Existing software methods are limited to relatively uniform processing on all the data presented and respond only to those specific inputs and situations that have been included in the program design. As the so-called solution space increases, these conventional software methods can no longer respond in the manner required in the military environment.

Recent advances in the technology of artificial intelligence as well as a number of commercial successes using artificial intelligence techniques indicates that artificial intelligence is on the verge of contributing to the solution of many of today's C.I. problems.

A knowledge-based system is a program that works by using knowledge and inference procedure that would normally require specific human expertise. "They work," according to Roy Vaughan, projects director at SPL's Research Centre, "by encoding knowledge itself. An expert system will mimic the reasoning processes of human beings, and can therefore be circumvented in its decisions."

In other words, knowledge-based systems will model the activities of the best human practitioners in any particular field, and hence its alternative description as an expert system.

SPL has designed and produced an expert system, Sage, and is working on a package aimed at real time environments for a mystery defence establishment.

The system described by Goodman and Brown has three major software components: a knowledge base, a situation database and a control system. The knowledge base is the area that contains the system's expertise. For example, cause and effect relationships; inferences; heuristics; implications; and so on. The situation database contains a representation of the current situation; and the control system determines how best to apply the knowledge to the situation.

Specifically, the report goes on, "we are studying the role of a knowledge-based system in a defence situation, and warning

operations centre. The tested hardware presently includes two Xerox 1100 processors, a Vax 11/780, and a Chromatics CGS 7900 display processor.

"The Xerox processors perform all primary computational support, currently Fortran calculations and sensor report preprocessing; the Chromatics provides high resolution colour displays, eg, maps, diagrams, etc. The Vax and Xerox processors are networked via Ethernet."

The system is designed to provide the military analyst with an interpretation of the current situation and possible courses of action.

It is at this point that the layman begins to take alarm at the possible projections of such systems: put bluntly, can we be certain that expert systems will always stop short at simply giving advice?

Professionals like SPL's Roy Vaughan warn of the tendency to sensationalise modern technology into science fiction; but it is worth remembering that most of the world's early science fiction writers have proved to be conceptual prophets: we do travel under the seas in submarines, we do travel through the air in flying machines, and we can journey into space.

The professionals then point out that expert systems are merely advisers to man, and that there must be no direct link between the system and the firing button. History, however, has already

There is a tendency to sensationalise modern technology into science fiction; but... most of the world's early science fiction writers have proved to be conceptual prophets

shown us that where this may be so now, it is unlikely to remain so. Our escalating dependence on electronics will negate both factors.

The calculator effect, where the calculations we once used to help our arithmetic have now limited our capacity to perform unaided arithmetic, will emerge sooner or later, purely in the interests of national security, this growing dependence on electronics will inevitably lead to the direct link between the expert system and the firing button.

Lay in turn suggests that the

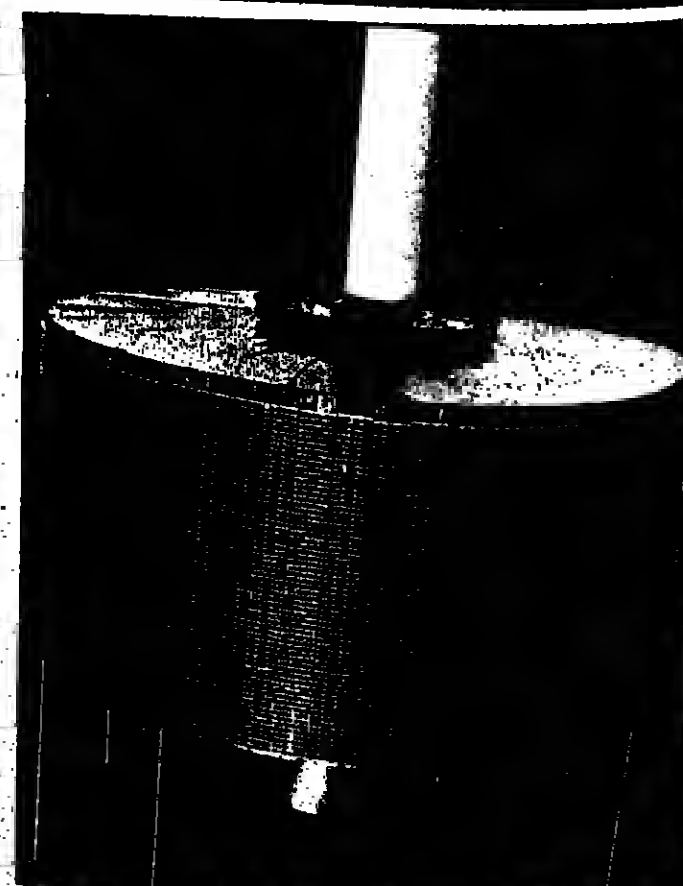


quality of the expert knowledge will be of primary importance to the future security of mankind. The scenario depicted in Goodman and Brown's report shows the system tracking an unidentified space object and postulating that it is probably a separation from an existing enemy satellite (without at this stage deciding whether it was launched or is merely debris).

It goes, however, show that there is a potential future threat to a friendly communications satellite, and the analyst therefore requests to see possible engagement data.

"Based on knowledge of the enemy anti-satellite system, the analyst determines that the proper command links couldn't possibly be established for the enemy system to manoeuvre for intercept and informs the knowledge based system (eg, "ENGAGEMENT NOT REALISTIC"). Thus he has injected his knowledge, in real time, into the system."

This must surely be the biggest weakness and danger in the whole concept of expert systems. Any knowledge based system can only reflect the knowledge and deductive patterns of the man or men who create and "feed" it. In other words, in a stroke of supreme conceit and/or folly, Man is creating a subordinate in his own image.



Could there be a threat to a friendly communications satellite?

SOFTWARE MONTH

Conventional warfare suits software

MODERN technology has produced two distinct methods of warfare — total destruction (nuclear); and precision defence and attack. Electronics is concerned only with the latter, and indeed there are question marks over its operational efficiency within the turmoil of the unleashed nuclear energy of the former.

However, it is in the realm of the euphemistically termed conventional warfare that electronics in general and software in particular is playing an increasingly important role.

ECM and ECOM are already every day abbreviations in military phraseology, standing for Electronic Counter Measures and Electronic Counter Counter Measures. These are generally software controlled. Information is received by increasingly sophisticated radar and/or other sensors, digitised and processed, and consequent action initiated.

Britain's Sea Eagle, for example, is a prototype guided missile sometimes described as a cross between Cruise and Exocet (but at this stage non-nuclear). Its primary aim is to punch a hole below the water line of enemy warships. It is being developed for the Ministry of Defence in the first instance by British Aerospace, but with

Cruise works on a different principle. It is preprogrammed to follow a set course to a predefined stationary target. It too hugs the ground to avoid detection, but rather than using radar to track its target, it takes periodic snapshots of the terrain.

These snapshots are compared to its programmed expectations (produced by sophisticated spy-satellites) so that on-board software can determine whether or not it is on target, and if not, what corrective action is necessary.

Electronic Counter Measures (apart from simply destroying the missile in flight) would probably take the form of persuading the software that the missile was still on target when it was actually heading out over the sea, or even back towards the launcher!

Electronic Counter Counter Measures will include safeguards to prevent this possibility. ECOM will then be invoked to nullify the ECM, and ECOMCM, ad infinitum. Future warfare will not be between mankind, but between different software systems!

At ground level, one of the major current projects is Bates, the Battlefield Artillery Target Engagement System, being developed by Scicon under subcontract to Marconi. Bates is a real

The modern weapon is aimed by electronics, it is guided by electronics, and it is sometimes even exploded by electronics

selected areas subcontracted to specialist companies. The software is being developed by Marconi.

Sea Eagle can be launched from helicopter or aircraft. Initial targeting data is loaded into the on-board processor from the carrier. Visual contact with the target is not necessary. Once this information is loaded the missile is launched. It has its own in-built radar and guidance system. It will select its target, and start to track. It will also drop down to a few feet above the waves in order to avoid detection by the warship's own surveillance equipment. This is precautionary ECM.

Meanwhile, the warship will sense or later detect the threat. Simple evasive action is probably useless since the missile is "homing" rather than merely aimed. Instead, the ship will probably produce an electronic smokescreen by ejecting tons of chaff (small strips of tin foil) into the surrounding atmosphere. This is ECM proper, designed to confuse the missile's radar system.

It will work. The missile's pinpoint target will suddenly disappear under a great cloud of electronic interference. But at this point, the on-board software must come into action. It must take into account the speed and direction of the ship up to the moment it "disappeared", the size of the chaff cloud, and perhaps even the speed and direction of the wind. It must then predict the most likely position of the ship within the chaff cloud. This is ECOM. The software must also be capable of distinguishing between chaff and a flock of birds; and between a ship and a whale.

time distributed system using microprocessor based computers allocated to a large number of mobile units. It is a multi-million pound software contract that will ultimately provide a complete command and control system for the Royal Artillery.

It is designed to meet the requirements of the modern army faced with the problem of controlling highly sophisticated weapon systems in very mobile configurations that will engage in very fluid battles. A real time system is needed for the assembly and dissemination of data for the command and control of artillery. This will be met by Bates, which uses a database spread over a number of machines.

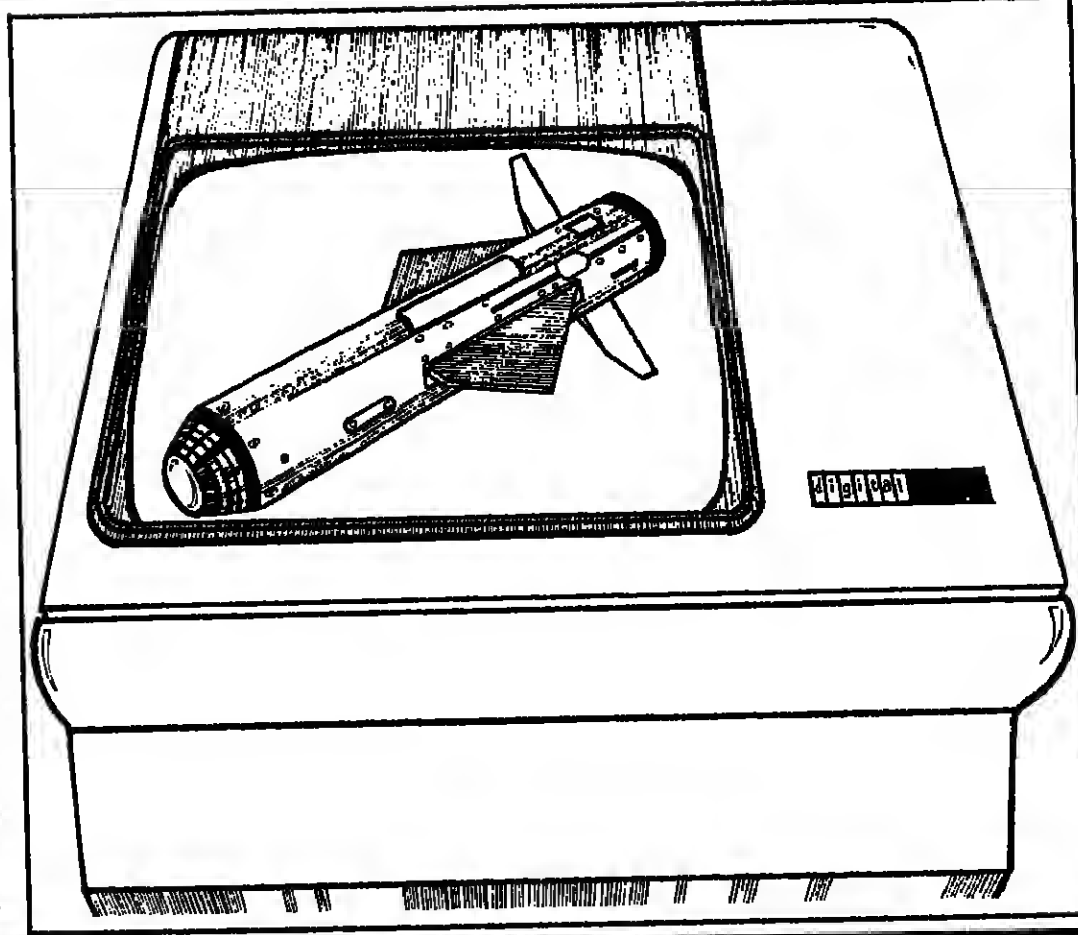
Direct links are maintained from the database to specially designed and robust visual display systems and printers situated in a large number of mobile units in the field. These units also enable commands and reports to be passed from one centre to another. Bates is being designed so that it will interoperate with other C.I. systems, both planned and currently in use with the British Army.

Scicon has also been engaged in the evaluation of expert systems, and has concluded that they can play a major role in the fusion of intelligence and operational data in C.I. systems. Initial research suggested that the ALX system is best suited to this application, and current research work is based on Scicon's own version of ALX now called SAL.

Throughout these various military projects, one curious effect is clearly emerging — military software is having the effect of dehu-

manisation that most personal of all mankind's pastimes: Killing each other.

The modern weapon is aimed by electronics, and it is sometimes even exploded by electronics. It is also deterred by electronics, evaded and deflected by electronics. In other words, modern warfare is rapidly becoming machine versus machine, in an environment where the quality of the software incorporated may be the determining factor between success and defeat.



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Acclaimed Ada has still to be born

IT is unlikely that there is anyone in the computing world unaware of Ada. But since the initiating force behind the language has always declared that it will not recognise part implementation of the compiler, and since there is still no recognised complete implementation, it must be the best known language that has never yet existed.

Ada was conceived in the mid 1970s when the US Department of Defence became increasingly concerned about the growing number of different and incompatible languages being used in defence projects, and the consequent maintenance bill that was even then estimated to be in excess of \$4 billion a year.

In 1975 a Higher Order Language Working Group (HOLWG) was established to produce a requirements specification for this new standard language. This specification was duly published under the codename Strawman, and the requirements were progressively refined into Woodenman, and then, in 1976, Tinman.

At this point 26 existing languages were evaluated to see if they met the Tinman requirements: none did, and proposals were subsequently invited for new programming language designs. Sixteen were received. From these, four were chosen. All were loosely based on Professor Niklaus Wirth's Pascal language.

Because of the sensitive nature of the contract, these four were given colour code names (Green, Red, Yellow and Blue, later identified as being led by CII Honeywell-Bull, Intermetrics, the

potential market is enormous. If it was limited to US defence it would be large enough. However, it is likely that NATO in general will adopt the same standard, and at the same time, there is no reason to prevent the language from becoming a commercial standard as well.

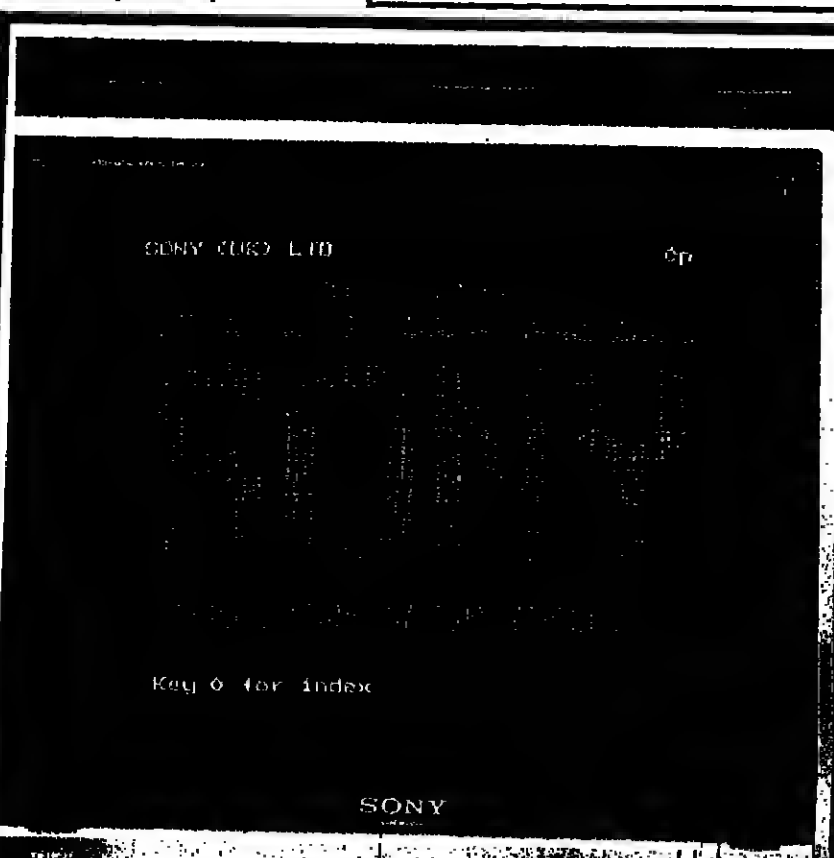
"Ada is not conceptually innovative. In many ways it is simply a compilation of all the best elements of all the best languages," says Jim Fisher, marketing manager at SPL. It has three major strengths: the ease of development and maintenance with an inbuilt security option, and an inherent portability. Individual tasks can be developed and compiled separately (hence recording security wherever different development teams who individually have no knowledge of the overall program), and automatically linked at run time.

An extension of this concept provides for full concurrency where several tasks can run independently of each other, communicating only when required by "delayed rendezvous".

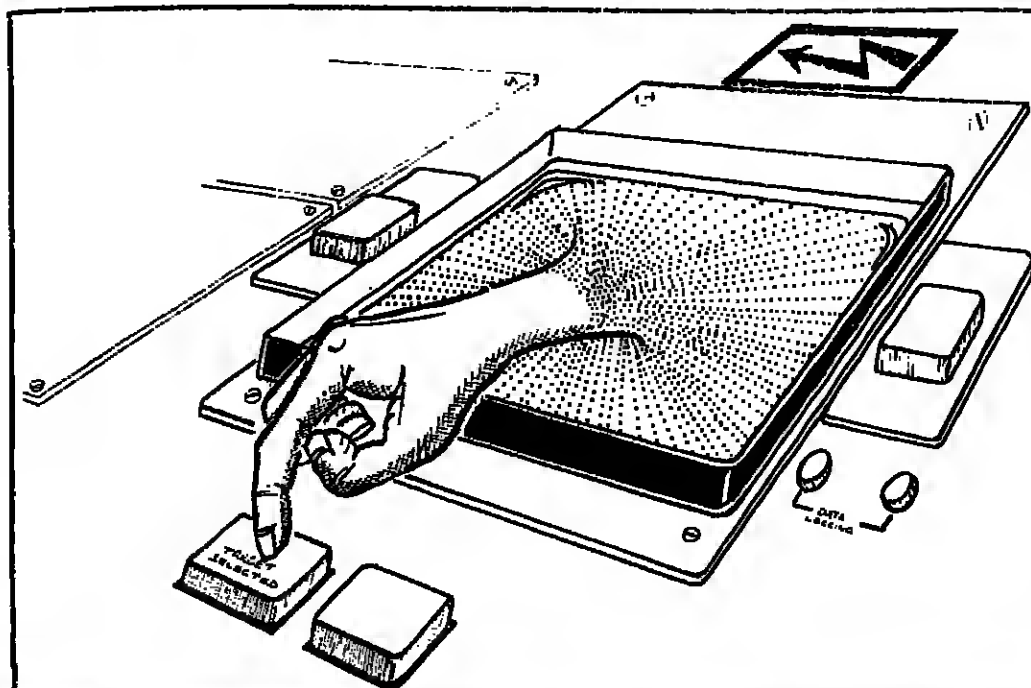
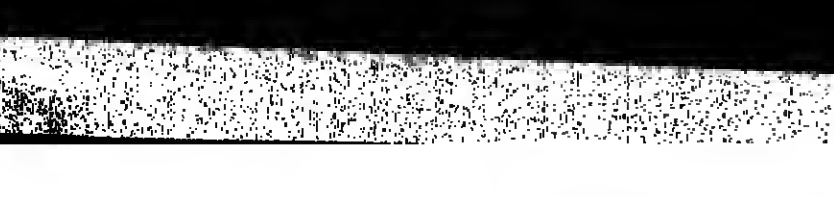
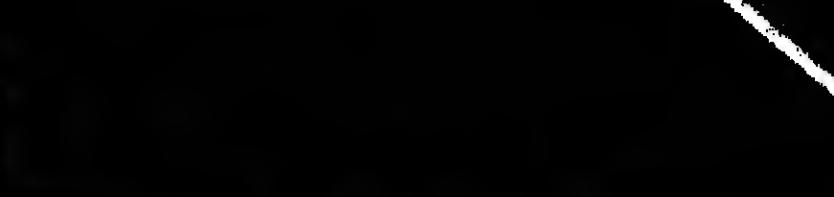
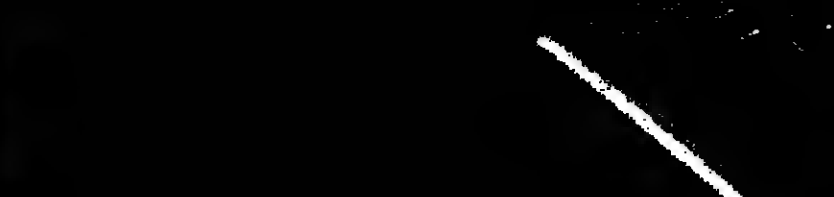
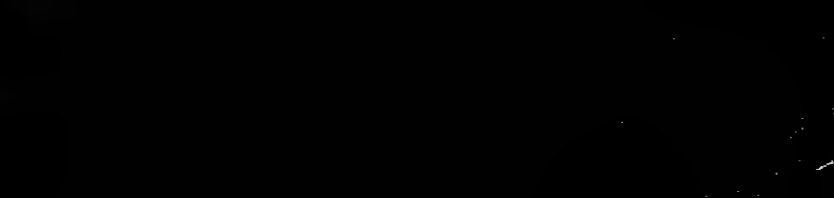
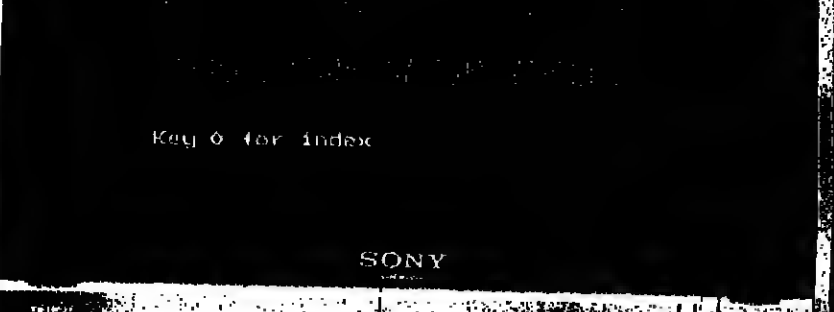
At such a rendezvous, the calling task executes an "entry call" and is itself halted until such time as the called task responds with an "accept" for that entry. The two tasks can then run together, or can exchange information as required; or can separate again until the next rendezvous.

Says John Barnes: "The best thing about Ada is its packaging,

pany's products marketing manager, explained: "The version produced by York University is the best part implementation currently available. We have now signed an agreement with York to market and develop this compiler."



Sony's 14-inch colour monitor was specially designed for general office use. simple anyone can operate it. And because it's a compact one piece unit, opposed to a terminal sitting on a plinth, it up less desk space.



Don't forget the quality

M. Leitch demystifies software quality assurance

THE Ministry of Defence is now finalising Defence Standard 00-16, *Guide to the achievement of quality in software*. When published, this standard will be called up in appropriate MoD contracts, and so is essential reading for anyone involved in quality assurance of software based systems.

Software quality assurance crops up with increasing frequency within the industry but there is

still a lot of mystery surrounding it.

"The common use of the word 'quality' generally implies a degree of excellence. However, in engineering circles the word is concerned with fitness of purpose. BS4778 defines quality as 'the totality of features and characteristics of a product or service that bear on its ability to satisfy a given need.'"

However, their distinctive roles would fail a Rolls and pass a Mini if the need was to fit a car into a 14ft garage. It just so happens that in most defence applications the important product features are also generally equated with a high degree of excellence.

Quality assurance (again according to BS4778) means "all activities and functions concerned with the attainment of quality." This is not very helpful and can lead to confusion over roles and responsibilities. A more helpful definition is provided in the EEA document *Establishing a Quality Assurance Function for Software*, which is a less formal document than DEF STAN 00-16 and is recommended reading for those not familiar with quality assurance. Its approach is

a quality plan. This is specific to the contract and states how, when and by whom quality activities will be carried out throughout the life of the project. In QTM 16 *Quality Assurance in the Programming and Use of Computers* (eventually to be superseded by Defence Standard 05-22/1 Part B), the quality plan is identified with the project plan, and the two require to be produced in conjunction with each other.

However, their distinctive roles should be recognised. A great deal more emphasis is generally placed on the project plan. A separate but related quality plan often shows the paucity of quality milestones.

"The quality plan requires that for a given package of software, inspections should take place following design, coding and testing (inspection is still the most effective method of identifying deficiencies). The quality control section of the codes of practice defines which aspects should be inspected at each of these points. Check lists are contained in Defence Standard 00-16, and also in the EEA publication *Guides to the Quality Assurance of Software*, but additions or deletions may be required to suit individual circumstances.

The common use of the word quality generally implies a degree of excellence. However, in engineering circles the word is concerned with fitness of purpose

to define quality control as relating to "the mechanism by which quality is achieved" and quality assurance as being "concerned with the operation of that mechanism."

Quality control is largely the responsibility of the project manager and is concerned with ensuring that the desired quality is defined, achieved and verified. Quality assurance is the responsibility of a separate quality manager (or chief engineer) and is concerned with providing the management and customer with the confidence that quality control has been planned for, is being carried out, and can be shown to have been carried out.

The standards to apply on a project may be specified in the contract. However, the available standards do not cover all aspects of the production process in sufficient detail and these will require to be supplemented by the company codes of practice.

For each aspect of the project these should define:

- The format of the documentation that must be produced;
- The procedures (or work instructions) governing the documentation;
- The standards of the documentation content.

The art of the software quality function is to make the software production process viable: hence the concentration on documentation.

Some defence contracts will require that the Defence Standard 05-21 *Quality Control System Requirements for Industry* will apply. In this case, it is a pre-condition that the Codes of Practice of the company have been inspected by MoD inspectors and that approval has been given.

Within the context of defence contracts there can be considerable variation in the quality attributes required. Consequently, it may be necessary to select from or add to the existing company codes of practice, and in this case it should be agreed with the MoD project officer or quality assurance representative.

In addition to the codes of practice, it is necessary to produce

Inspection will normally be carried out by one or more individuals nominated by the project manager. In some circumstances it may be required that the documentation be submitted to the quality auditors and the project manager. The outcome of the inspection will be an inspection report that should be kept on record with a recommendation to pass or fail the software under review.

An important consideration when inspecting packages in stages is what to bring under configuration control. It is undesirable to freeze code before it has been tested. It is also undesirable to allow structure, interfaces and techniques to change without proper modification control. In general, those areas that have been inspected should be frozen.

The role of quality assurance in the process is to carry out audits at times agreed on the quality plan to ensure that inspections take place and that the results are recorded and acted upon.

Of course the important question is how much does it cost?

140. During quality assurance is often a very expensive option. Unfortunately, it is likely that the quality control will decay rapidly, leading to major problems when the system is being set to work and in the subsequent maintenance phase.

On the other hand, it can be overdone. Too onerous a quality assurance system is oppressive on staff and can increase costs significantly. It can delay the production of software and slow down the overall project. It is therefore important to balance the quantity of quality assurance work based on a knowledge of the expertise of the people carrying out the work; the importance of meeting the quality targets in the final system.

Quality assurance alone may cost between 1% and 15% of the total job, but remember that there are knock-on costs on the job itself for very high levels of quality assurance.

The author works for Glasgow-based software house Yard Ltd.

of course, like its larger and smaller counterparts, the 14-inch gives unrivalled picture quality due to the unique Sony Trinitron tube.

There's no smaller colour view-data terminal in the world than the Sony 9-inch desktop model. It gives you some uniquely advanced message facilities as well as a 14 page memory and a keypage function.

It also gives you access to most of the features of the larger 14-inch model, but in a more compact package.

Both models are available in a range of configurations to suit your needs. For more information, contact your nearest Sony representative.

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COMMUNICATION SYSTEMS DIVISION

SONY

شركة سوني

Multifunction terminal is a comfort for operators

A DISPLAY station, the UTS 30, designed to provide operator comfort and ease-of-use, has been introduced by Sperry Corp.

Available in two versions, the UTS 30 can function as a powerful editing terminal or as a user-programmable terminal and desk-top computer. It supports a variety of peripheral devices, including four printers, a 5 1/4-inch diskette subsystem with up to 2.6 Mbytes of storage, and a magnetic strip reader.

The editing version of the UTS 30 can be field upgraded to the programmable model by replacing a program cartridge with a diskette interface and connecting the diskette subsystem.

Eye fatigue is reduced by using low contrast colours for the display screen and keyboard and by providing background illumination and improved focus on the display. The non-glare, 12-inch diagonal display consists of green characters on a dark background.

The entire display is claimed to be flicker-free. The field of view of the display is within normal eye span, while a movable base allows horizontal and vertical adjustment to the best viewing angle.

The new "low-profile" keyboard is designed for comfortable touch-typing and to avoid strain on



Sperry's UTS 30 display terminal.

the back. All the control keys required to operate the terminal and initiate data transfer are located on the keyboard and easily reached.

For the basic version of the UTS 30, a program cartridge, accessible from the top of the unit, provides the editing functions. System updates and future UTS 30 enhancements can be achieved by inserting

a new cartridge.

In the programmable version, the program cartridge is replaced by a diskette interface that supports up to four diskette drives.

Sperry (CW), Computer Systems, Sperry Centre, Stonebridge Park, London NW10 8LS. Tel: 01-965 0511.

Service firm offers repairs within one day

THE hardware maintenance division of Software Sciences has introduced three levels of service, aimed at providing users with a clear idea of the maximum equipment downtime they are likely to experience. The highest level of service guarantees repairs within one working day — or a loan machine is supplied free of charge.

At Level 1, an engineer will respond to a call within eight working hours of the fault being reported to the hardware maintenance division's service control centre. If the equipment cannot be repaired on site, it will be taken to the nearest Software Sciences engineering workshop for repair and will be returned within 10 working days.

If, for whatever reason, the Hardware Maintenance Division is unable to complete the repair within this time, a loan replacement machine will be supplied free of charge.

Under Level 2, an engineer will respond within eight working hours of the fault being reported, and if the fault cannot be repaired on site, it will be taken back to a workshop and returned within

three working days. Again, a loan replacement machine will be supplied free of charge if these timescales are exceeded.

Level 3 provides the highest degree of service, with equipment removed from site being returned within one working day, or a loan machine being supplied. Each level of service can also be provided with a four working hour initial response, and a five or six-day cover.

Software Sciences Hardware Maintenance Division services third party maintenance of installed micro and minicomputer systems and peripherals.

With hundreds of customers throughout the UK, the hardware maintenance division services printers, VDUs, terminals, communications devices, word processors, point-of-sale terminals and small business systems.

Software Sciences is part of the Information Technology Division of Thorn EMI.

Software Sciences, 282-292 Farnborough Road, Farnborough, Hants. Tel: (0252) 544321.

Darkcrest launches new range

DARKCREST has launched a new range of computer systems based on the Digital Equipment LSI 11/23 16-bit processor board.

Called the GT 2309 Series, the new system will run a wide range of operating systems from DEC and other suppliers, including RT11, RSX11-M and 11M PLUS, RSTS/E, DSM-11, Cobol, Fortran 77 and Basic Plus 2. In addition, available from other sources through Darkcrest, are the Unix operating system and the new Asix standard Mumps.

Darkcrest's GT 2309 hardware package system starts at £13,000 and includes a 256 Kbyte 11/23, the first 70 Mbyte fast Winchester disc drive and an industry standard 2400ft reel magnetic tape transport with the first four-line interface.

Options include MOS memory of up to 2 Mbytes, up to four 70 Mbyte Winchester and 32 serial lines — all being available as an integral 3ft cabinet computer system.

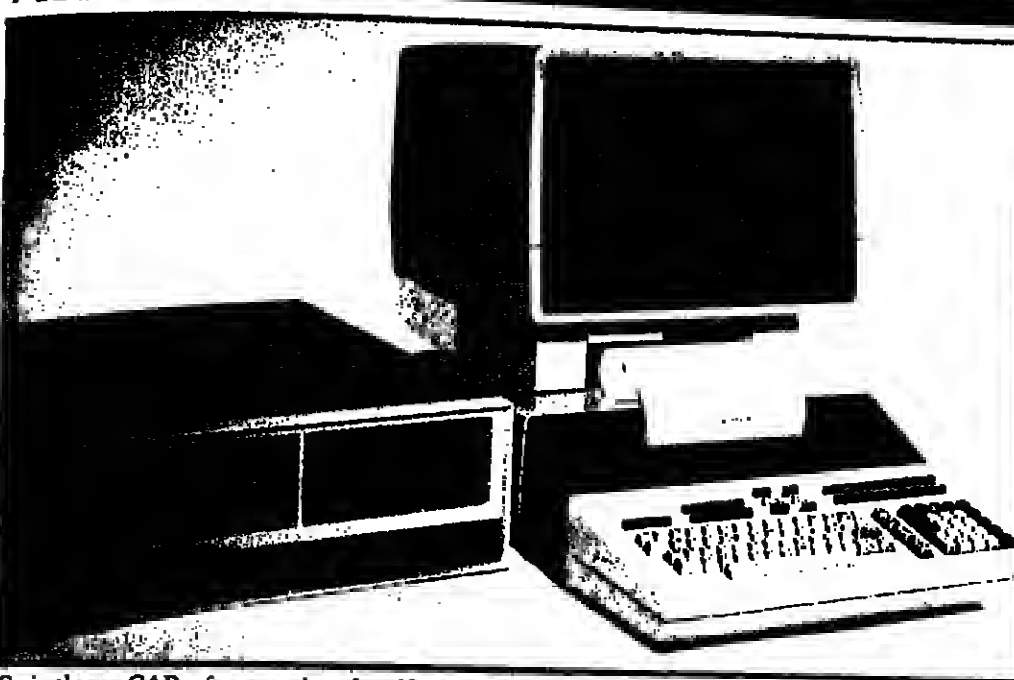
A key feature of the new package system is the speed of the Winchester disc drives. With a transfer rate of over 1 Mbyte per second and an average access time of 28 milliseconds, this eight inch Winchester disc drive is one of the fastest on the market. In particular, such performance capabilities allow two or three times as many users on the LSI/23 than was previously possible, according to Darkcrest.

The system includes as standard an industry compatible magnetic tape transport, resulting in media compatibility with IBM, DEC, and others. The read/write speed of up to 100 ips at 1,600 bpi allows users to back-up the entire contents of their Winchester in minutes. Options include the new standard 3,200 bpi and average tape throughput speeds up to 200 ips for specialist users.

The system is suitable for an office or laboratory type environment.

Darkcrest (CW), Chapel Court, Borough High Street, London EC1. Tel: 01-403 5060.

PRODUCTS



Genie, the new CAD software package from Norrie Hill.

Low-cost entry to CAD for HP desk-top users

USERS of the Hewlett Packard 9845 series of desk-top computers are offered what is described as a simple and cost-effective entry to CAD with a specifically designed software package from Norrie Hill. It is compatible with any configuration of the HP9845B/C and can be operated with any mass storage device and type of plotter.

The package, called Genie, has been developed from Norrie Hill's Sorce 45 and Sorce 36 systems. It provides fully interactive 2D draughting and is suitable for a wide range of applications in the electronics, engineering, petrochemical and architectural fields.

Genie is easy to use, being operated by special function keys. Commands can be implemented by a single key stroke.

Drawings may be produced at any size from A4 up to 10 metres by 10 metres. Sixteen drawing levels are available as standard.

Drawings are created on the CRT by means of the on-screen cursor and ruler to a scale of 1:1 or any user-defined scale. A window function allows a particular section to be displayed where greater drawing detail and accuracy is required.

A feature of the package is its use of symbols. Up to 99 library symbols, comprising simple drawings, can be stored and rapidly accessed by a single keystroke. Additionally the operator can define up to 200 other frequently used symbols which are then stored by a four-character name in separate files.

Text is fully scalable in both X and Y co-ordinates and strings of text may be rotated and slanted.

Genie provides powerful editing facilities, allowing the operator to erase, move or alter any part of a drawing. Block editing enables a complete drawing or particular

section to be scaled, rotated, moved and copied. A further facility allows linear and circular repeat of block copies.

Although the standard Genie system will meet most users' CAD requirements, it can be easily expanded, with additional storage and plotting facilities. Norrie Hill will also advise on special application software.

Bill White, marketing manager, commenting on the package, said: "Genie is a highly versatile system and is ideal for existing users of the HP9845 who want to enter CAD without the expense of additional hardware. It is equally suitable for the user who wants an all-round computer system not only for draughting but also for technical and business applications."

Norrie Hill (CW), Albany House, 489-491 London Road, Camberley, Surrey GU15 3JA. Tel: (0276) 681656/6.

Half-height floppy from Tandon International

A HALF-HEIGHT 5 1/4 inch floppy disc drive from Tandon International is claimed to equal the capacity and performance of full-size 5 1/4 inch drives, but allows two drives to occupy the same cabinet space as one standard size drive.

The Tandon TM55 is now available throughout Europe.

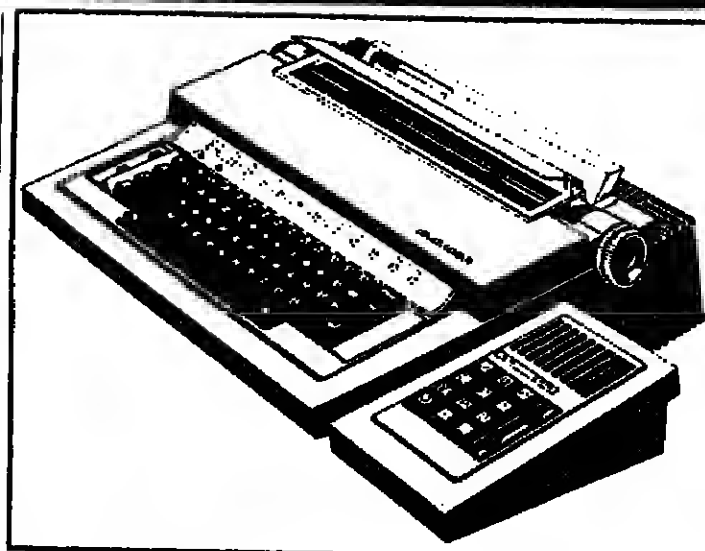
Two models, the TM55-2 and TM55-4, are both half-height profile, and microprocessor controlled for high performance. Each has a three millisecond track-to-track access time and up to one Mbyte storage capacity.

The TM55-2 is a double-sided 48 tracks per inch drive with half Mbyte capacity and the TM55-4 is a double-sided 96 TPI drive with one Mbyte capacity.

Both models can read and write in a single-density format or, using MFMT or other recording techniques, in double density format.

The 3 msec track-to-track access time is achieved through use of a split-band head positioner, driven by a stepper motor. Average access time is 90 msec. An on-board microprocessor controls spindle speed; centres the media; positions the heads to achieve minimum hysteresis and switches the write current for optimum recording quality, providing a programmable ready signal.

Tandon International (CW), 5 Suttons Industrial Park, London Road, Reading, Berks RG6 1AZ. Tel: (0734) 664676.



The Praxis 41 printer/typewriter.

Printer/typewriter that links to most micros

CONTROL Universal of Cambridge has announced a deal with Olivetti for distributing the new Praxis 41 printer/typewriter.

The Praxis 41 offers a much heavier duty cycle than the previously released machines based on the Praxis 35, but at a higher cost. Included in the price is a choice of serial or parallel interfaces to enable the 41 to work with almost any microcomputer.

The daisywheel printer hooks into the computer via a compact interface adaptor to produce high quality output.

The serial version (illustrated) includes a numeric keypad and both receives and transmits data. This means that all communication with the computer can be carried out using the Praxis 41 keyboard.

When not being used as a printer, the Praxis 41 has the functions of a sophisticated electronic typewriter. These include 100 printable characters, interchangeable daisywheels, 17 function keys, repeat key, cancel key, correction device and an acoustic cover for quiet efficiency.

Used as a computer printer, the Praxis can automatically type error-free form letters, memos and other documents at the rate of 120 words per minute, while retaining an "individually typed" appearance.

Control Universal (CW), Unit 2, Anderson's Court, Newnham Road, Cambridge, CB2 9EZ. Tel: (0223) 358757.

Process control devices

THE 3000 series of digital instruments from Computing Techniques is a family of low-cost, high technology tools which feature the popular Beckman display.

They can be supplied in standard or ruggedised form. This family has been designed to directly interface with most standard microcomputers in process monitoring and control applications.

The most advanced model is the microprocessor-controlled 3060 which may be directly programmed from a keyboard thus enabling the end user to update the ranging or data transfer ratios to suit changing requirements.

It shows four digits on the 0.6in

Beckman display, is mains powered and can handle a mixture of analogue and digital inputs as well as performing simple control functions.

Other models in the 3000 Series are the 3080 which shows 3 1/2 digits, the 3090 with three digits and the 3085 with 4 1/2 digits.

A feature of the 3080 and 3085 is plug-in input signal conditioning which makes them suitable for all types of input — differential, positive/negative offset, single-ended, current and RMS.

This allows flexible scaling without the need for external components.

The 3090 is programmable and is designed to solve scaling problems associated with non-linear

transducers and to provide fixed limit control.

Typical applications include linearising thermocouples, thermistor bridge and A/D converter signals; reading cylindrical, spherical and conical tank contents from pressure transducers; set point and alarm activation; and indication of log, trig and arbitrary functions of measured values.

Ruggedised versions have heavy metal cases. The 3000 Series is also available without cases for OEM applications.

Distributor and agent enquiries are welcomed.

Computing Techniques Ltd (CW), Brooklands Rd, Billingshurst, West Sussex RH14 9RZ. Tel: (040 381) 3171.

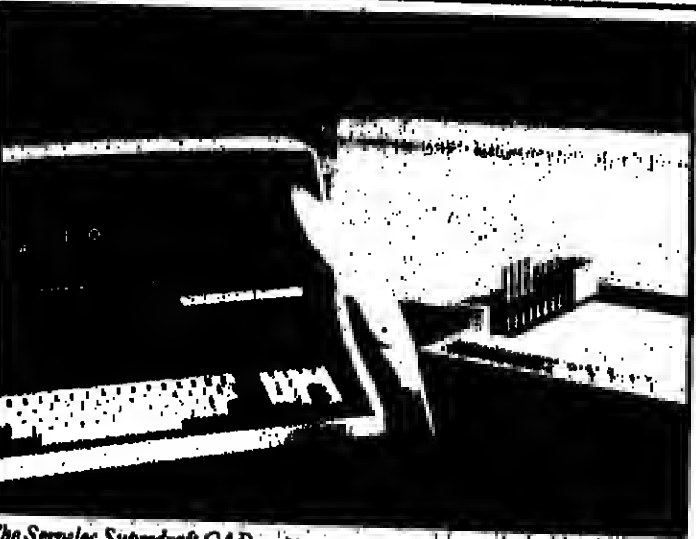
Low-cost draughting

SERVELEC has launched a high-performance, low-cost computer aided draughting system.

The Superdraft CAD system is a complete standalone two-dimensional package offering all the advantages of an expensive, up-market system at a cost designed to fall within the reach of firms both large and small.

Operating in conjunction with the Superbrain QD desk top computer, Superdraft offers an accurate draw, edit, and modify facility.

Servelec Computer Systems (CW), Atlantic Street, Altrincham, Cheshire WA14 5DD. Tel: 061-941 2327.



The Servelec Superdraft CAD system.

Wang extends VS systems family

WANG has extended the low end of its Virtual Storage — VS — product line with the introduction of the VS 25 and VS 45 Distributed Office Systems.

The VS 25 and VS 45 are targeted at small to medium-sized companies, for remote, or departmental-level processing, but both systems incorporate all the traditional features of Wang's larger VS 80, VS 90 and VS 100 systems.

Each model features a 16-bit CPU with 32-bit datapaths and a new, microprocessor-based, system architecture, utilising 64K-bit RAM chips. Both offer fully-

loadable control memory, allowing all operational microcodes to be loaded from disk, or diskette, at system start-up time and full software compatibility into the entire VS product line.

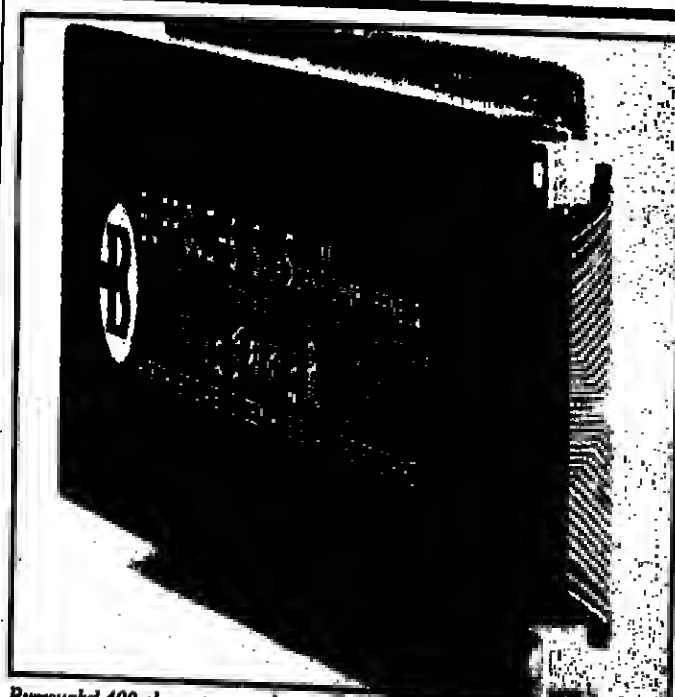
The systems also provide one megabyte of virtual address space per task and, subject to British Telecom approval, remote diagnostic capability.

Says Ian Dery, Wang UK managing director: "While the VS 25 and VS 45 systems incorporate new processor technology and a newly implemented system architecture, they are software compatible with the entire VS product

line. They also offer increased maintainability through remote diagnostics and unmatched price-performance ratios."

The models provide competitive replacement and easy conversion prospects for traditional departmental-level processors, such as IBM's System 32 and 34 — or for distributed data processing systems, such as IBM's Series 1, 3270 family and the 8100. Wang has also incorporated RPG II conversion aids.

Wang (CW), 661 London Road, Isleworth, Middx. Tel: 0181-549 4151.



Burroughs' 400-character gas plasma display.

Burroughs display is a gas for data

THE DISPLAYS division of Burroughs OEM marketing corporation has launched in Europe a new 400-character gas plasma display panel for use in data terminals. With an 80-column format, and 100% pixel addressing, the panels are suitable for alphanumeric and graphics displays, in commercial and industrial applications.

A 2000-character version of the display is to be introduced soon, and the company expects to take an increasing share of the data display market currently dominated by CRTs (cathode ray tubes). With a physical thickness of only 2in, the new displays will typically occupy only 20% of the space needed for a standard CRT.

They use a combination of DC internal addressing and a newly developed technology incorporating an AC layer for storing data indefinitely. This "Self-Scan" AC memory layer eliminates the memory refresh electronics needed with existing types of gas plasma display panels, and cuts the drive current for the 400-character display from 656 to 25.

Another benefit is the increased density of dot spacing compared with conventional gas plasma displays.

A touch-sensitive overlay is available, enabling data to be input directly into the data processing system simply by touching the required part of the display panel. In some applications, this could eliminate entirely the need for a conventional keyboard.

The new panels offer a 130 degree horizontal and vertical angle of view, and enhanced relative brightness (580, 28uc). They are suitable for use in rugged industrial environments, where high levels of shock and vibration and extremes of temperature are encountered.

The optional touch-sensitive overlay (TSO) consists of a pressure-sensitive sandwich construction which is fitted to the front of the display panel.

Burroughs OEM Marketing Corporation (CW), Langwood House, Darnley Street, High Wycombe, Bucks. Tel: (0494) 26271.

Rapid way to Alter your text

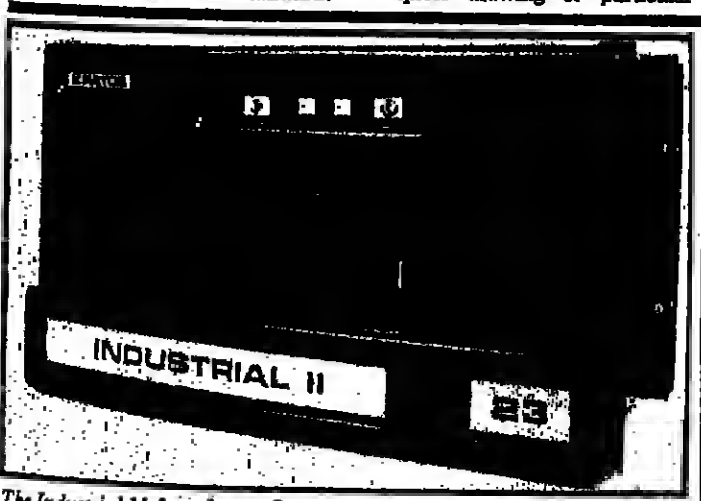
RAPID Recall can now supply a new text editor for use on Intellex Series 111 microcomputer development systems, direct from stock. Known as the Alter Text Editor, it is menu-driven and has been designed to be easy-to-learn and easy-to-use.

In addition to providing full screen editing facilities, Alter offers features such as move, copy and delete that will easily handle large blocks of text. Additional commands are also available to find and selectively replace blocks of text.

Alter allows commands to be prefixed with a count value so that commands can be repetitively applied to portions of the file being edited. To simplify command entry, the last command and last text strings (for "find" and "replace" commands) are retained for use at a later time.

Alter has been designed with a programmer in mind. Two files can be edited simultaneously and the user can easily switch between files. Alter includes options to automatically indent text which is useful when entering high-level language source code and can considerably shorten the programmer's task.

Rapid Recall (CW), Rapid House, Darnley Street, High Wycombe, Bucks. Tel: (0494) 26271.



The Industrial 11 from Instem Systems.

Industrially packaged LSI-11 computers

A SPECIALLY packaged LSI-11 computer from Instem Computer Systems is announced for monitoring and control applications in industrial environments.

The Industrial 11 system offers unique configurations based on the full range of DEC LSI-11 family of processors including LSI-11/23 Plus and provides full compatibility with standard DEC software and operating systems.

All models are housed in 19in card cages and have the ability to meet diverse application requirements with a wide range of memory, communication and plant input/output modules.

The basic system comprises a controller rack housing three sections: Q-Bus control, plant input/output, and power supplies. The system is designed with vertically oriented modules, and a single 19in controller rack offers a compact yet powerful system, with full

facilities for system extensions.

The control section offers 16 dual height Q-Bus slots. Program memory may be any Q-Bus compatible modules, including Instem's own EPROM and RAM modules.

The 32 Kbyte EPROM module has on-board programming facilities which, under LSI-11 control, enables efficient system loading without the use of separate PROM programming units.

The Instem non-volatile RAM is based on CMOS modules in 64K and 32K versions, with on-board rechargeable cells, providing data retention of four weeks or longer in the event of system power loss. The EPROM/RAM mix can be configured to meet individual application requirements.

Instem Computer Systems (CW), Walton Industrial Estate, Walton, Stnne, Staffs. Tel: (0785) 812131.

Data retained with little power

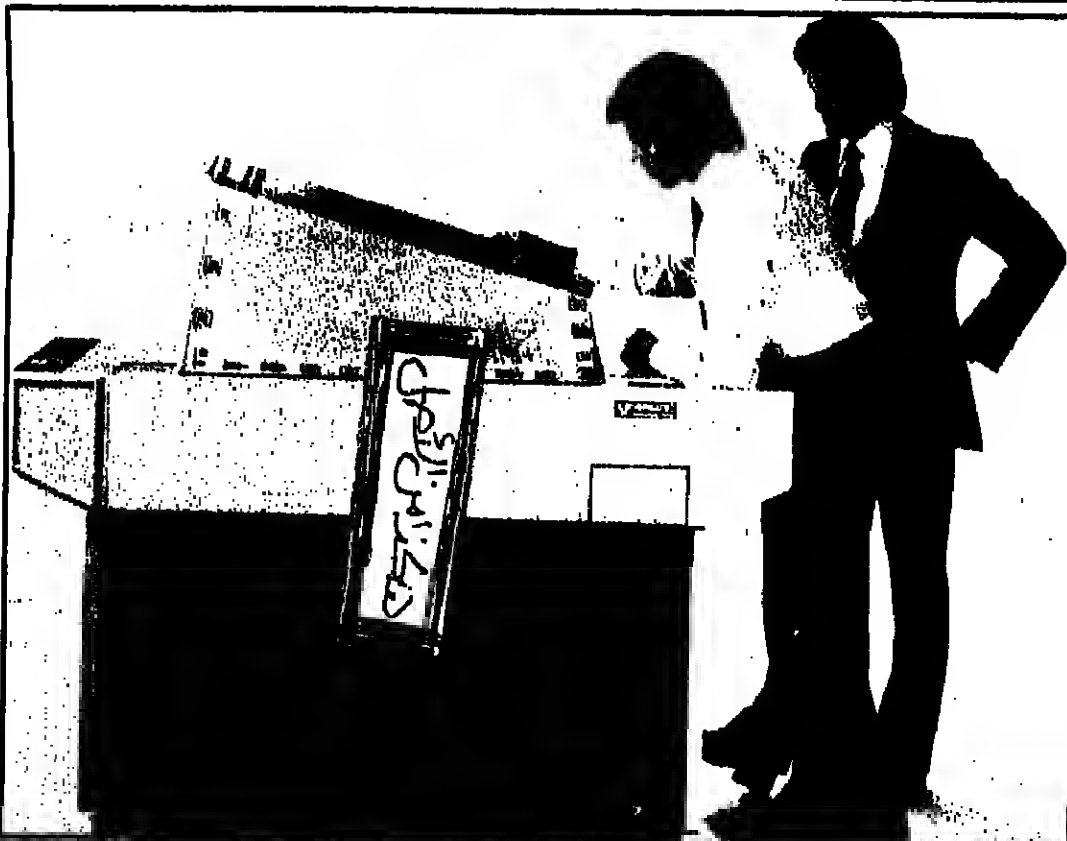
THE latest chip technology has been exploited for ZX81 owners in Cambridge Microelectronics' Memic-81. The self-contained card unit plugs on to a ZX81 and provides an extension adaptor at the rear.

Memic-81 and 81.2 provide 2 and 4 Kbytes of RAM for the user. The CMOS technology of the memory chips is the same as that used by some of the latest wrist-watches and pocket calculators. This allows the chips to retain data with a tiny amount of power. A state-of-the-art, long-life Lithium battery provides this power for about 10 years.

Memic units can be placed anywhere in the 8-16K area of the ZX81's memory map by a plugable links arrangement.

Since Memic-81 is designed to save data securely for long periods, a logical extension to the idea is to program the load and save routines themselves into Memic-81.

Cambridge Microelectronics (CW), 1 Milton Road, Cambridge CB4 1JY. Tel: (0223) 314814.



The full colour electrostatic plotter from Versatec.

Full colour electrostatic plotter

WHAT is claimed to be the world's first full colour electrostatic printer/plotter is launched in the UK by Versatec.

The colour plotter electronically produces the full colour spectrum with translucent toners in magenta, yellow, cyan and black. It is the first time that a graphics output user can combine the advantages of the high speed and high quality output of electrostatic technology with full colour capability, says Versatec.

The system produces computer-defined four colour half-tone printing, but for normal computer aided design and geophysical applications a user can define his own specific colours out of a total of seven line colours and 256 colour areas.

Versatec Electronics (CW), 27-35 London Road, Newbury, Berks RG13 1JL. Tel: (0044) 635-31221.

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Versatec Electronics (CW), 27-35 London Road, Newbury, Berks RG13 1JL. Tel: (0044) 635-31221.

Pascal compiler launched for PDP-11 Unix systems

PASCAL-2, an optimising compiler to run under the Unix operating system on Digital Equipment Corp's PDP-11, is now available in the UK from Unit-C, the new computer and software division of Burotherm International.

Pascal-2 features a multipass operation. It generates compiled code that is said to be 30 to 40%

smaller and twice as fast as Oregon Software's Pascal-1 compiler, the predecessor to Pascal-2.

A key feature of Unix is the supporting tools that provide a software developer with standard, easy-to-use programs that aid in coding and development. The Pascal compiler system contains similar kinds of tools, debugger, execution profiler, and de-

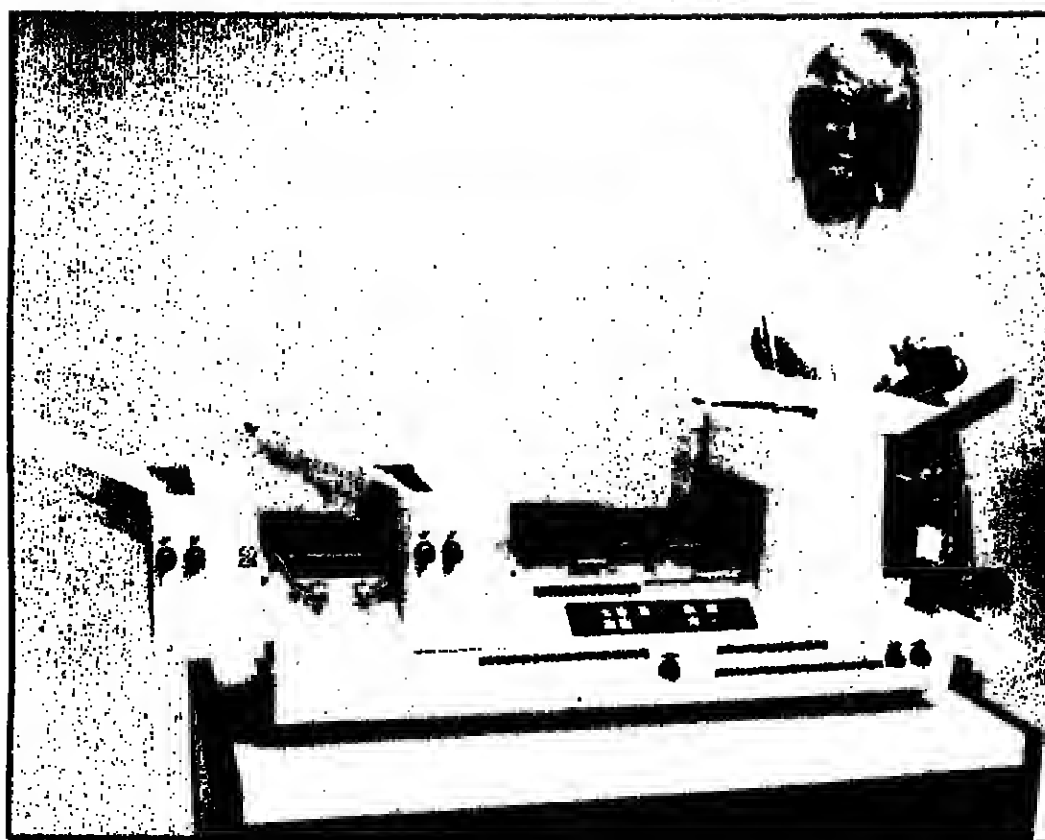
velopment utilities.

The debugger allows the programmer interactively to solve at the level of the source program logic errors in applications, thus simplifying and speeding development. The debugger runs separately from the application code being debugged; keeps track of multiple compilation units and performs breakpoint debugging

without slowing the application code.

With data supplied by the profiler, the developer can reorganise portions of the code to improve substantially overall execution speed.

Unit-C (CW), Dominion Way, West, Broadwater, Worthing, West Sussex BN14 8NT. Tel: (0903) 212114.



Pitney Bowes' model 3340 table-top inserter.

Inserters '16 times faster than a human'

A USER friendly inserter designed for handling a variety of documents such as invoices, statements and reminders and direct mail pieces has been introduced by Pitney Bowes.

The new machine, model 3340, is a table-top inserter suited to insurance companies, local authorities, government departments, building societies, professional practices, stores, large offices, wholesalers and distribution houses, says Pitney Bowes.

The 3340 automatically puts up to two inserts into envelopes, typically items such as letters, bills, cards, leaflets, business reply

envelopes and advertising matter.

Major features of the 3340 — reliability, fast throughput, easy servicing, simple setting-up/operation and low-cost — were named as most important by potential users during detailed market research conducted by Pitney Bowes, which anticipates meeting virtually all the demands of the market for such products.

Its speed, 3,600 cycles an hour, makes it about 16 times faster than a human doing the same task, enabling it to keep up with computers and copiers generating material for mailing.

Operating the system requires a

minimum of training, says Pitney Bowes. Simple controls with internationally understood symbols are located on the front and top surfaces of the machine, and a main control panel immediately informs the operator of machine status.

A feature unique to the 3340 is that it will not stop midway through a cycle, since this increases the likelihood of jams occurring. By stopping once a cycle is complete, operator involvement time is cut considerably.

Pitney Bowes (CW), The Pinnacles, Elizabeth Way, Harlow, Essex CM19 5BD. Tel: (0279) 26731.

Range of peripherals for the OEM market

A RANGE of industrial peripherals, utilising advanced mask-programmed microcomputer technology, has been introduced by ISG Data Sales.

Comprising both industrial terminals and a portable data storage and retrieval system made by Gercom of West Germany, the new range has been developed specifically for the OEM market and offers a number of unusual features.

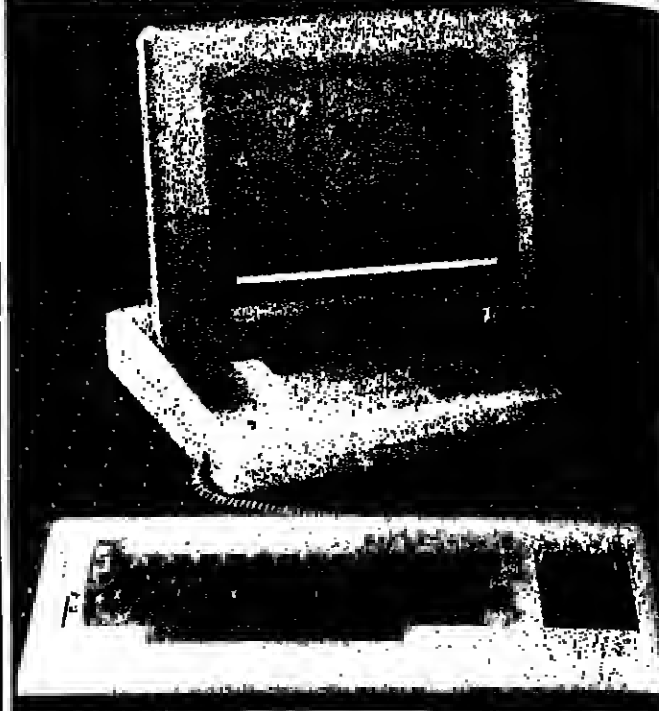
The Gercom terminals, the Micropro/1 and Micropro/80, are available either as portable units or for rack mounting.

Designed to serve the needs of both OEMs and end users by interfacing to remote computers and other similar equipment, features include cursor control, eight auxiliary outputs and the ability to provide customer-defined control functions by extending the internal firmware. Special dustproof models are also available.

The Micropro/1 range has a 32 character by 16 line display format with full ASCII keyboard and a switchable printer output. Fourteen control functions (plus buzzer) and 19 extended control functions are provided, as well as eight auxiliary control functions switchable via the serial link and keyboard. Two card construction simplifies field maintenance and each character may be individually inverted and/or set to full intensity.

The Micropro/80 is similar to the Micropro/1 but built to a fuller specification with a choice of larger screens. Features include a standard 80 character by 24 line display format, an additional 16 non-volatile function keys, more control functions, self-diagnostic testing and a programme memory of 40 Kbytes.

ISG Data Sales (CW), Unit 5, Wellington Industrial Estate, Basingstoke Road, Spencers Wood, Reading, Berkshire. Telephone Reading (0734) 884666.



The Qume QVT terminal now available from ISG Data Sales.

Menu set-up made for ISG's Qume terminals

ISG Data Sales has introduced two Qume terminals at prices from £520. The QVT 102 and 108 emulate the Lear Siegler ADM5, the Televideo 910, 912, 920 and 925 and the Hazeltine 1500, but have extra features and cost less.

Features of the terminals include a menu set-up mode instead of DIP switches; a 7x9 character format with descenders for good readability; 11 function keys on the QVT 102 and 22 on the QVT 108; a built-in line drawing set for making up charts, graphs and forms; a 25th status line; line and page block transfer modes; and insert/delete line and character functions.

The cheapest model, the QVT 102, offers an 80 column 16 line display in green or amber, which tilts and swivels, and the separate keyboard has a low profile numeric pad, detachable auto-repeat and key click.

Both the 102 and 108 have a serial auxiliary printer port as standard, which may be addressed via a single key stroke.

ISG Data Sales (CW), Unit 5, Wellington Industrial Estate, Basingstoke Road, Spencers Wood, Reading, Berkshire RG6 1AW. Tel: (0734) 884666.

Both the 102 and 108 have a serial auxiliary printer port as standard, which may be addressed via a single key stroke.

ISG Data Sales (CW), Unit 5, Wellington Industrial Estate, Basingstoke Road, Spencers Wood, Reading, Berkshire RG6 1AW. Tel: (0734) 884666.

ISG Data Sales (CW), Unit 5, Wellington Industrial Estate, Basingstoke Road, Spencers Wood, Reading, Berkshire RG6 1AW. Tel: (0734) 884666.

Protocol converter for IBM, Univac systems

A PROTOCOL converter has been launched that allows users of IBM and Univac systems to add low-cost, Tektronix-compatible Color Retro-Graphics terminal enhancements from Digital Engineering.

When interfaced to IBM and Univac systems the protocol converter, developed by Kaufman Research Manufacturing provides complete support of the asynchronous Datamedia ColorScan 10 and 10X series terminals upgraded with Retro-Graphics printed-circuit board assemblies. Full compatibility is maintained via emulation of the IBM 327X and Univac UT540 series terminals.

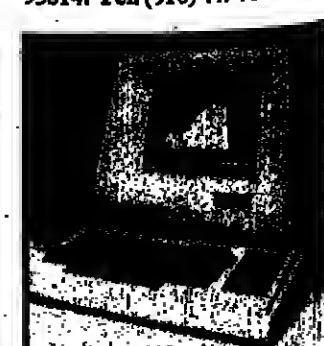
The ASCII-compatible protocol converters are both polled concentrators and terminal emulators. The 870G (IBM protocol) and 871G (Univac protocol) connect up to eight Retro-Graphics terminals to a single synchronous computer port, reducing host port requirements. All lines can run simultaneously at speeds up to 19.2 Kbaud.

A keyboard-controlled "side door" feature allows users of IBM or Univac systems to communicate

with other host systems, for example DEC or HP, from the same Retro-Graphics terminal.

In an IBM environment, the Colorscan graphics terminal can be connected at high baud rate over IBM supported network systems. Additionally, the device will fully emulate 3270 terminals and can communicate with 327X applications, including CICS and IMS.

Digital Engineering (CW), 69 Berent Drive, Sacramento, CA 95814. Tel: (916) 447-7600.



Digital Engineering's Color Retro-Graphics enhancement.

Higher capacity cartridge drives

TO meet the increased demand for higher storage capacities within the 5 1/4 inch Winchester fixed/removable disc drive market, Advanced Peripheral Products has introduced the higher capacity Micro-Magnum 5/10 and 5/15 cartridge drives.

The Micro-Magnum 5/10 version offers 19.5 Mbytes of formatted storage capacity, with 13 Mbytes on the fixed disc and 6.5 Mbytes stored on removable cartridges.

The 5/15 offers 26 Mbytes of formatted capacity, with 19.5

Mbytes fixed and 6.5 Mbytes removable. The drives utilise a shared spindle and electronics for shared fixed and removable functions and through sharing these resources, drive reliability is increased.

The DMA fixed/removable drives provide the same capabilities as half-height fixed and removable drives operating from separate resources. The Micro-Magnum drives are form-factored for use in desk-top, mini and microcomputer systems with front-panel dimensions identical to

those of standard 5 1/4 inch floppy disc drives.

The drives incorporate a patented design innovation leading to improved packaging, increased system reliability and maximum data integrity. These include the drive's head design, servo-reading capabilities and closed-loop tracking and positioning systems.

Advanced Peripheral Products (CW), Graham House, Twickenham Road, Feltham, Middlesex TW13 6HA. Tel: 01-895 0836.

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For details of this outstanding opportunity please telephone Barbara Allen on 0734-595346, or write to the Reading office enclosing a full CV. Ref. 104

Sales registers now have chip memories

THE latest phase in the upgrading of the NCR 2140-7000 series of electronic sales registers is now available. The Phase IV registers have chip-based mass memory (back-up storage) instead of floppy disc storage. This is claimed to make price look-up faster, more accurate, and more reliable than flexible or floppy disc storage.

The NCR 2140-7000 series was launched in 1978 and, as subsequently updated, has features still considered advanced, including:

- Standard proprietary types of memory storage;
- Distributed intelligence, allowing optional local processing at terminals;
- Cassette data capture at point-of-sale, plus direct communications to a central processor;
- A range of fast answer printers;
- Time-of-day recording and reporting;

■ Shared data collection and totals consolidation for up to 16 clustered terminals supported by a master;

■ Downloading of programs to satellite terminals and interrogation by the master.

The Phase IV registers have mass storage, which starts at 192K (about 192,000 characters of data) and can be increased in 64K steps up to 512K. It can, therefore, store data such as sales figures, stock counts, department numbers, full alphanumeric item description and price, to facilitate sales and stock analyses.

Price look-up software can be tailor-made by NCR, which will train customers' staff.

Prices of the new registers start at about £2,000.

NCR (CW), 206 Marylebone Road, London NW1 6LY. Tel: 01-388 8244.



THE NCR electronic sales register upgraded to provide stock control for retailers at low cost.

Financial planning on Zilog 8000

AN advanced financial planning system is now available for use on Zilog's System 8000 Supermicro. Known as Micro FCS, it has been written by EPS Consultants using a product that has taken over 100 man years to develop and incorporates eight years of experience in planning systems.

EPS Consultants currently has mainframe planning systems installed in more than 700 companies.

Taking advantage of the Unix operating system and the networking capability of System 8000,

Micro FCS can be used for long-term financial planning, cashflow, budgeting, consolidation and manpower and production planning applications.

The system is based on simple English instructions which allow the user to define precisely the relationships, calculations and report formats required. A range of functions such as depreciation calculation, Net Present Value (NPV) and Discounted Cash Flow (DCF) are pre-programmed into the system to save time.

Micro FCS will run on Zilog's

low-cost System 8000 Model 11 (about £11,500) through to the more powerful Models 21 and 31. These can be configured to provide up to 4 Mbytes of memory and up to 320 Mbytes of Winchester mass storage.

System 8000 is fully expandable, and will be compatible with the next generation of 32-bit microcomputers.

Zilog Systems Division (CW), Zilog House, Moorbridge Road, Maidenhead, Berkshire. Tel: (0628) 39200.

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those of standard 5 1/4 inch floppy disc drives.

The drives incorporate a patented design innovation leading to improved packaging, increased system reliability and maximum data integrity. These include the drive's head design, servo-reading capabilities and closed-loop tracking and positioning systems.

Advanced Peripheral Products (CW), Graham House, Twickenham Road, Feltham, Middlesex TW13 6HA. Tel: 01-895 0836.

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The ideal candidate will have several years of EDP audit experience, acquired in a multinational, multi-business manufacturing environment; the ability to influence senior levels of management; work with a large degree of autonomy; write concise and lucid reports.

The incumbent may be of any nationality but, in addition to English, he must be proficient in at least one of the languages of the countries in which he operates (Italy, Spain, France). The job location may be in Italy, Spain, France or Belgium, with frequent international travel. Compensation and benefits are likely to attract even the most demanding candidates.

Please apply in confidence to Universal Communication, chaussée de La Hulpe 122-B, 1048 Brussels, Belgium. Please mention on the envelope the reference 981

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The Computing Centre has vacancies in an exciting environment for three Assistant Computing Officers (ACOs) to be based at the University of Edinburgh.

The Edinburgh Regional Computing Centre is responsible for the development and support of a number of computer systems for the University of Edinburgh. The ACOs will be responsible for the day-to-day operation of the Centre and will be involved in the development and support of the Centre's computer systems.

The successful candidates will be responsible for the day-to-day operation of the Centre and will be involved in the development and support of the Centre's computer systems.

Applications are invited from graduates with a degree in a relevant field and who are interested in computer systems.

The successful candidates will be responsible for the day-to-day operation of the Centre and will be involved in the development and support of the Centre's computer systems.

For an application form and further details, please contact the Computing Centre, University of Edinburgh, Edinburgh EH8 9JY.

Programmers

NEWCASTLE UPON TYNE up to £8,732

Northern Gas operate one of the most advanced computer installations in the North East. Running under MVS, CICS and VSFC, our three 8 Megabyte IBM 3031's with 15,060 Megabyte of fixed disc storage, support an SNA Network of some 300 terminals. Plans for significant expansion are currently under way, creating opportunities for Programmers at Regional Headquarters, Killingworth, Newcastle upon Tyne.

The persons appointed will produce Computer Programs, with guidance from more senior staff as necessary, and will be involved in all aspects of programming for new computer systems as well as for changes to existing systems. 2 or more years COBOL or ASSEMBLER experience is essential, preferably in an IBM environment.

Salary will be in the range £7,447 - £8,732. Posts are open to both men and women, and benefits are those normally associated with a large progressive organisation.

Application forms, quoting reference number W119A, are obtained by phoning 0632 685882 anytime, or writing to Personnel Services Manager, Northern Gas, PO Box 1GB, Newcastle upon Tyne NE99 1GB. Applications must be returned by 23rd June 1983.

Previous applicants need not reapply as their applications are still under consideration.

NORTHERN GAS

Exceptional Young SYSTEMS ANALYST

Financial Software: HP 3000

c £14,000: rising to £19,000

Our client is one of Europe's fastest growing electronics companies. Their success is built on market leadership, high profitability and continuing major investment in advanced micro-technology and an attractive new facility. Equally, their personnel policies for graduate calibre, success-oriented professionals are outstanding.

World demand for an expanding product range and 100% real growth creates this new opportunity. You will take personal responsibility for the active development and maintenance of software to meet wide-ranging commercial needs, in the UK and Europe.

Ideally a graduate in computer science/math, you must have successfully implemented yourself financial packages through the complete development cycle; HP 3000 experience an advantage; probably age 21-31.

As importantly, you must have the personality, flexibility and commercial flair to be effective across the total spectrum of sales, marketing, personnel and manufacturing functions. Excellent career prospects as products become increasingly software dependent.

Starting salary will be c £14,000, in a range to £19,000. A valuable non-contributory benefits package and relocation assistance to the Thames Valley are company this.

Initially, please phone or write, in complete confidence, to Ivor Harland at Kramer Westfield Associates, 21 Victoria Street, Windsor, Berks, SL4 1HE. Telephone No. Windsor (07535) 56155.

Kramer Westfield

CHALLENGING OPPORTUNITY WITH LEADING BRITISH MICRO MANUFACTURER

GROUP LEADER (LABORATORY PRODUCT DEVELOPMENT) £12K to £17K (DEPENDENT ON EXPERIENCE) OXFORD-BASED

This is a challenging new opportunity to spearhead our product development programme in the laboratory/instrumentation market.

Research Machines has already built up an impressive user base for its computer systems across the spectrum of scientific research applications. Our corporate plan now calls for a major expansion in this sector through the development of innovative microcomputer-based hardware and software products using state of the art technology.

Your job will be to create and lead the small team responsible for this important development work. In particular you will:

- Support the Marketing Department in developing product strategy and defining new products.
- Specify, plan, and manage product development projects to rigorous standards of performance, quality, and time scale.
- Build up and manage a group of professional

hardware and software engineers. Provide technical leadership and innovative thinking on product design.

The successful applicant for this demanding post, therefore, will probably have:

- A wide appreciation of laboratory/instrumentation applications.
- Demonstrable project leadership experience involving successful completion of major development projects using microprocessor-based hardware and software.
- At least five years in product development.

We offer a particularly attractive range of benefits, including good salary; 25 days paid holiday; free BUPA, life and disability insurance; pension scheme; and generous help with relocation expenses in this area.

If you are interested in this vacancy please contact Polly Keane on Oxford (0865) 726136 or write for an application form, quoting reference: LP/CW6.

(4019)

RESEARCH MACHINES
MICRO COMPUTER SYSTEMS

RESEARCH MACHINES LTD, 100 West Street, Oxford OX2 0HR. Tel: 01865 726136

Defence ADP Training Centre Lecturer- Computer Systems

The Centre, at Bradford Camp, Dorset is responsible for the professional ADP training of officers and NCOs of the Armed Forces and MOD civilians. It has a DEC 10 multi-frame computer with 2 MDP mini-computers to front end and remote processor. Two Ferranti Argus 7000 computers are used for real-time training. All courses are residential.

The range of basic courses covers fundamental professional training, systems analysis and design, and programming. Other courses cover real-time systems and project management. There is an Advanced Course (30 weeks) in preparation for BCS examinations.

The person appointed will be expected to lecture to all courses (training will be given, if necessary, in particular aspects) and to contribute to the development of the subjects taught.

Candidates (men and women) must have a degree in computer science or related subject, or have taken the DADPCT Advanced ADP Course, or held equivalent qualifications. They must also have had 3 years' experience in the application or testing of ADP and be experienced lecturers or be able to instruct.

Starting salary within the range £8020-£12,995 (under review) according to qualifications and experience. Accommodation may be available. Promotion prospects.

For full details and an application form (to be returned by 28 June 1983) write to Civil Service Commission, Alcon Link, Basingstoke, Hants RG21 1JB, or telephone Basingstoke (0256) 68551 (answering service operates outside office hours). Please quote ref. G/6000/2.

Ministry of Defence

Support Officer Hotel Systems

IAL is a large international organisation providing a sophisticated range of high technology services throughout the world. A major growth area is in the field of providing comprehensive computer systems and services to hotel groups within the UK and abroad.

Based within our Commercial Group at our Head Office near Heathrow we are now looking for a man or woman to work with customers during implementation of the Maxial Hotel Computer System. As well as providing technical support to the sales team, you will be expected to plan the smooth switch over to computerisation and, where necessary, make changes to the system software.

With at least 2 years experience in the computer industry, you must also have practical experience of programming, preferably in RPL. Familiarity with the Reality computer system and/or knowledge of the hotel industry would both be advantageous.

We are offering a salary of around £9,000 pa and benefits include 4 weeks annual holiday, pension and life insurance scheme.

To apply for this exciting opportunity telephone Andy Todd on 01-574 5134, or write to him at IAL, Aeradio House, Hayes Road, Southall, Middx. UB7 5NJ. Please quote Ref. K087.

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SIGMA/CP5 CUSTOMER SUPPORT

A consultancy role for an experienced
SYSTEMS PROGRAMMER
£10,000-£12,000 p.a. Slough

Honeywell is a name associated with excellence — both in our product range and in the success and professionalism of our multi-national organisation. We pride ourselves on providing our customers not only with advanced systems to meet their needs, but also the highest level of post-sales support.

Now, with this in mind, we are looking for someone with sound experience of programming on Sigma systems operating under CP5 to join us in a vital support and consultancy role.

Based in our Southern Marketing Office in Slough, you'll be liaising directly with Honeywell CP5 Users throughout the UK and will also become directly involved in the CP6 operating system and other newly introduced hardware and software products, undertaking on-site project work as well as general consultancy and problem-solving activities.

It's a highly visible role that requires in-depth experience in the use and support of Sigma software together with excellent interpersonal skills and the ability to quickly extend and develop your technical skills into new areas.

In return we offer an excellent salary in the range £10,000-£12,000 dependent upon experience, plus a full range of benefits including excellent training and career development prospects within our progressive organisation.

Please write to David Abbot, Honeywell Information Systems Ltd., Honeywell House, Great West Road, Brentford, Middlesex.

Honeywell

DATABASE DESIGNERS — ANALYSTS — PROGRAMMERS

We wish to recruit a number of experienced computer professionals for Tangent's Systems and Programming Support Team. Enquiries will be welcomed from both contract or permanent staff and we can offer attractive opportunities and excellent remuneration to all successful candidates. Current requirements include the following:

DEC/VAX, COBOL	Database Designer, Consultant	Essex/Surrey
NOMAD	Database Designer	London
COBOL, DL1 some CICS	Senior Programmers	Home Counties
ASSEMBLER/GRAPHICS	Mini/Micro Programmers	Home Counties
CIS/COBOL/MICROS	Senior Programmer	London
RPG11/111, S34/S38	Programmer/Analyst	Kent/Surrey
ADF & IMS/DC	Programmer/Analyst	London
HF3000, + or Stock	Analysts	Bucks
Control Exp	Analysts	Wiltshire
Large Integrated Systems Exp	Programmers	London
Natural & ADABAS	Programmer/Analyst	Scotland
HF3000, COBOL	Programmer	Home Counties
DEC/VAX, PASCAL		

Please contact: TANGENT COMPUTER SERVICES LTD.
102/103 South Street
Hamford
Essex RM1 1RX
Tel: Hamford (0766) 750261

tangent
SUCCESS IN THE SOFTWARE WORLD

Project Managers Herts. to £18,000

A major international development engineering centre with existing growth plans requires experienced software engineers to fill project management roles. Candidates must be capable of technical leadership of up to 30 man teams in the area of communications, or real time software. The company offers excellent long term careers and attractive benefits. Relocation assistance.

Contact Terry Harvey

Circuit Designers London to £10,000

One of the country's leading technical systems houses is continuing to expand and requires bright, graduate, electronic designers to work on circuit design, micro systems design, low power logic and custom logic. We would like to hear from people with a minimum of one year's experience. Assembly level programming ability would be advantageous.

Contact Brian Coates

Tech. Authors Wilts/Beds/Herts. to £12,000

We would like to hear from Technical Authors with 2 or more years experience who would find the challenge of working closely with software development teams to their liking. Background should include programming or previous software technical writing experience. There are additional opportunities for authors with mixed Hardware and Software ability. Excellent career prospects.

Contact Terry Harvey

Systems Designers Herts. to £13,000

Software engineers and electronics engineers are required to participate in major new product developments in communications, office system products and L.A.N. applications. Previous experience is only confined to technical applications. The primary requirement in this company is a positive attitude and a desire to succeed. The company has an excellent program of internal training. Relocation assistance.

Contact Terry Harvey

PDP and VAX Berks. to £14,000

Experienced software engineers who have two or more years background implementing programs in a technical environment will find our clients have many challenging projects for them. We are particularly keen to hear from people with a mixture of assembler and high level programming ideally to include knowledge of micros and Pascal.

Contact Brian Coates

Tandem Comms. N.W. M'sex. £9K-£13K + car

This expanding, turnkey vendor of Tandem computer systems is seeking highly motivated software people to work on advanced applications using Tandem equipment. Experience in communications and screen based applications using COBOL is required. The company has its own in-house Tandem system providing training on this very popular equipment. Candidates must be presentable.

Contact Terry Harvey

'C' & Assembler Programmers Wilts. c. £10,000

Rarely does the opportunity occur to join a company of this class. It has built an international reputation for its software products in Europe, USA and Japan. We would like to hear from graduates with a minimum of one year's experience who believe they can make a significant contribution using PDP/M68000 UNIX development systems.

Contact Terry Harvey

Support Specialists Herts. to £13,000 + car

Due to continuing expansion this subsidiary of a major multinational corporation requires additional support specialists for their European support centre. Candidates must have a software background, a knowledge of comms. protocols, a hardware appreciation and a good client contact manner. Candidates will most likely have had experience with a computer manufacturer or systems house.

Contact Brian Coates

VME Specialists Berks. to £12,000

A world leader in software packages including DBMS and sophisticated program development aids requires programmers to work on enhancing the company's capability in VME products. The work will require development and product support. Candidates should have experience with Pascal, or a similar language. This is an exciting opportunity to join a young team.

Contact Brian Coates

Comms. S/W Design Herts. to £12,000

Develop your career and your existing communications software skills by joining a company already firmly established in this high growth sector of the computer industry. We are seeking software people with experience in developing 3270 compatible systems and as much experience as possible in X.25 and L.A.N. products. Experience in 'C' or PASCAL using M68000 and/or TI9900 would be useful.

Contact Terry Harvey

Product Leader Beds. to £15,000

Ideally candidates will have a background in systems software development gained with a manufacturer. They must be capable of technical leadership in the area of operating systems and compilers. Candidates will have an management skills and be able to demonstrate previous ability in running at least one major project. Long term prospects and reloc. assistance.

Contact Terry Harvey

Consultants London to £18,000

Travel, project variety and technical challenge are the key aspects of work in this dynamic, expanding systems house. We would like to hear from candidates who have software experience in communications, database, network architecture or real time applications. Assembler plus high level programming background preferred. Ideal equipment - minis: VAX, Tandem, PDP; micros: 8085/86, M68000 and UNIC.

Contact Terry Harvey

Evening and weekend telephone numbers:
Terry Harvey: Gt. Missenden (02496) 4705
Brian Coates: Chesham (0494) 785722

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The ideal candidate, aged 25-35, will have at least five years' technical sales experience, some of which will be in the Middle East. A background in Data Communications, Telecommunications or Computer Hardware is desirable. Experience of full sales support of complete communication systems would be advantageous.

Along with the basic salary and commission would be a company car, free accommodation, one month's paid leave p.a. and return air tickets.

For full details contact:
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County Chambers, Weston Road
Southend, Essex
Telephone: (0702) 333272
Telex: 996478 Lowry G

ACME MARLS LIMITED STOKE-ON-TRENT require an ANALYST/PROGRAMMER with experience of RSTS/E and Basic Plus

Applications are invited from suitably qualified people with two to three years' experience gained on Systime/PDP11 hardware. Main duties will include assisting the DP Manager to implement and further develop the company's commercial and production control systems and therefore knowledge of such areas should be an advantage. Graphics experience may also be considered useful.

Applications in writing, giving full details of qualifications, present salary and career, to:
Peter Williams, DP Manager
ACME MARLS LTD.
Clough Street, Henley, Stoke-on-Trent ST1 4AF

(3898)

sb

Sharpe Bennett Associates Limited CONSULTANTS, SYSTEM ANALYSTS AND EXPERIENCED COBOL PROGRAMMERS

Due to the continued expansion of our software house operation, we require more experienced personnel to strengthen our team. We are looking for all levels, for males and females with a proven track record in business system development.

Candidates must have a practical understanding of modern interactive computer methods and a thorough knowledge of business systems. Salaries and benefits are commensurate with ability and position and can include car, private medical cover and pension scheme.

1 Aldworth Park, Goring Way, GORING BY SEA, West Sussex BN12 4UP

(3898)

WELSH JOINT EDUCATION COMMITTEE CYD-BWYLLGOR ADDYSG CYMRU COMPUTER OFFICER Salary £10,071-£12,174

Readvertisement at Increased Salary

Applications are invited for the post of COMPUTER OFFICER for the Computer Section of the Welsh Joint Education Committee. The Committee uses an ICL ME 29 running an on-line examination system and the person appointed will be responsible for managing, maintaining and enhancing the system.

The salary will be in the range of P01/2-P01/3 (£10,071-£12,174) and the starting salary will depend upon experience. Applicants should preferably be graduates with experience in the following areas: Recent systems analysis, programming in COBOL and working on an ICL ME29.

Further details and application forms (to be returned by 30th June 1983) may be obtained from the Secretary, Welsh Joint Education Committee, 245 Western Avenue, Cardiff CF5 2YX.

LOLA

London On-Line Local Authorities is a data processing consortium of four London Boroughs based in modern offices at Enfield. Currently we have two large IBM computers - a 370/158 AP and a 4341 model 2 - due for replacement this year. We have a teleprocessing network of over 300 terminals and our computer applications span a wide range of activities and current technology. We use TSO/SPF for programming work.

We have vacancies for

Programmers £7,500-£11,000

Trainee Programmers £5,500-£7,500

Programmers should be experienced in PL/I and will be required to work on both batch and teleprocessing IMS systems. Applicants should have at least 18 months' good programming experience and have worked in teleprocessing. The starting salary will depend upon length and type of experience.

For the trainee posts we require either graduates or TOPS-trained people (graduates preferred) who have successfully completed PL/I courses. For trainees with no relevant experience the salary will be near the bottom of the scale but could be higher for applicants with PL/I experience.

Further details and application forms (closing date for return being June 20) from:

Beryl Barrington
LOLA
Tower Point North
Sydney Road
Enfield, EN2 8UE
Tel: 01-395 8611, Ext. 278

LOLA

SYSTEMS DESIGN ENGINEER

Will be responsible for research and development in new signal processing techniques, particularly as applied to Modems and Control Systems. A good honours degree or PhD. Applicable to modern signal processing is required along with a minimum of five years' relevant experience. DLM 23/1

South Coast**SOFTWARE DESIGNERS**

Our client requires Development Engineers to design and implement Software for a Multi-microprocessor Military System. They will design and test, and be using, an Emulator and Cross Assembler running on a Vax machine. Candidates should have a degree and at least three years' assembler language on DEC machines in a defence environment. DLM 23/3

West London**SOFTWARE ENGINEERS**

Our client requires Engineers to plan and prepare Software Programmes for Military Microprocessor Digital Message Switching Based Communication and Speech Processing Equipment. A degree is needed, and an experience of software preparation for M6800/68000. Experience of Pascal, Basic or Fortran is essential. DLM 23/4

South Coast**HARDWARE ENGINEERS**

A major Systems House specialising in defence systems have a number of openings for Engineers with one or more of the following skills: Building Microprocessor Systems, Floating Point Systems, Digital Electronic Engineering, and Fault Analysis. DLM 23/8

Surrey**OPERATIONAL ANALYSIS**

One of the largest International Software Houses, has a number of openings at all levels, for graduates with experience in the Operational Analysis field. Candidates with experience of Defence Systems will enjoy a progressive professional career path. DLM 23/7

London and Surrey**SOFTWARE DESIGNERS**

The centre of Advanced Sensor Technology is looking for degree qualified people, able to develop detailed software design concepts and to lead technically, a team of implementation Programmers. DLM 23/8

West Country**SENIOR PROGRAMMER**

A major defence contractor requires a Senior Programmer to produce, test and support software on a VAX 11/780 to support the development of Microprocessor based software. Candidates should hold a degree or HND/HNC in a related subject, and experience of 8086 Assembler, knowledge of VAX/VMS and Corel 68. DLM 23/10

Surrey**HARDWARE ENGINEERS**

The Radar Division of an International Electronic Manufacturer is strengthening their New Product Development Team. Engineers are required to develop new digital hardware for high speed processing of Real Time Signals. A minimum of three years' Logic Design plus a degree is needed and an EMC background would be helpful. DLM 23/11

Middlesex**SENIOR SOFTWARE ENGINEER**

A degree, plus a minimum of three years' experience in Real Time development at Assembler level design is required. High level language experience in Pascal, Coral, BCPL when applied to micro-based systems would also be useful. DLM 23/12

Bedfordshire**SOFTWARE ENGINEERS**

A major International Telecommunications Company requires engineers educated to degree standard, with at least two years' experience of Coral, familiarity with the use of GPM, Intel, MDS or application concerned with Man/Machine Interface would be advantageous. DLM 23/13

Wiltshire**SOFTWARE ENGINEERS**

A major telecommunications company seeks additional Programmers to work on state-of-the-art switching systems. Candidates should have a degree, be in their twenties and have experience in some of the following: real-time multi-microprocessor operating systems; comms devices; HDLC; high or low level languages; e.g. Assembler, C, Pascal, SPC switching systems; and handling experience. CMT recommendations, System 12/40 and System X. DLM 23/13

Switzerland**GRAPHICS**

A London Systems House is currently seeking scientific programmers to work on the Fortran or Pascal language, and also on the Pascal language. Whilst the majority of programming work is undertaken in-house, candidates will be expected to work on clients' sites both before or during the implementation phase. Ref: L22/2

West Country/Yorkshire**COMMAND & CONTROL**

Our client, a major defence contractor, has a number of openings in their headquarters in London for a minimum of one year's experience in Real Time systems, and a minimum of two years' experience in one or more of the following: Pascal, C, Fortran, or VAX/VMS. DLM 23/13

London

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As the senior communications professional within the organisation, the Communications Manager will have prime responsibility for the design, development, implementation and effective functioning of an integrated communications network and for the management of the communications section. The position carries budgetary authority for communication lines, equipment and associated services.

The requirement is for substantial overall technical competence in the major areas of current communications technology, data, voice and text, with demonstrable experience of designing and implementing cost effective integrated networking facilities. It is likely that the successful candidate will have held a senior communications management position within a large organisation and will have played a significant strategic role in long term network planning. Minimum age indicator is around 30.

To apply, please send a CV or write or telephone for a Personal and Professional History Form, to JOHN KITCHEN, at the address below, quoting Ref. GC1133.

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UY
Telephone 01-633 0866

BIS Applied Systems

PROJECT MANAGER/ TECHNICAL SUPPORT MANAGER

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VAX/VMS Expertise

Automated Systems is one of the Crown Colony's most dynamic and professional systems houses with a list of clients that includes the most prestigious international companies and government departments. As a highly successful DEC o.e.m. the company is progressively moving into the VAX market and operating at the forefront of VAX technology.

The appointed technical support manager will be involved in all software services as they relate to customers. He will take responsibility for all major projects and the support of the sales force. He will also run the VMS training courses, tune the software to use all VMS facilities and establish VMS-related services such as in-house bureaux. Thus the position is seen as both fascinating and highly demanding. A certain amount of travel within the region can be expected.

Hong Kong is one of the most exciting markets in the world and works at a very fast pace. Thus the successful candidate will be commercially aware, resourceful and resilient with a flair for lateral thinking. He will have in-depth knowledge of VMS and other VAX system software and will continually keep abreast of all developments in this area.

In return for these considerable skills the successful candidate will receive a renewable two-year contract, a tax-free salary, an apartment with all basic furnishings and an allowance for relocation. He will take up a vital high-profile position with one of Asia's most go-ahead computer systems organisations and will continue his involvement with technology's leading edge. To learn more contact James De Slun on 01-938 1804. Out of hours you'll reach him on 01-373 1496.

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PR International, 20 Kingsway, Church Street, London WC2B 6EX. Tel: 01-399 9183

your appointments register

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ICL/ON-LINE EXP to £12K
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HONEYWELL to £12K
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Essex

BASIC to £11K
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IBM/UNIVAC/COBOL to £12K
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NCR 8200 to £14K
Financial SW LONDON

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IBM/ICL to £12K
Stock Control/Commodity Control London

CAO/CAM to £16K
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IBM/BURROUGHS to £15K
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ICL/ME29 to £16K
Commercial Design Eorks.

IBM SYSTEM 34/38 MAAPICS to £13K
Sussex

Software Engineers

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IBM PL/1, IMS DB/DC

IBM DLI Programmers with 3-4 yrs. COBOL exp.
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IBM PL/1 CICS DLI

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ICL VMEB IDMS, all levels
ICL VMEB COBOL Programmers, some with IDMS
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OPERATIONS
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ICL Gili Operators with VMEB, Immediate start, long term
IBM System 3 Ops for London, long term
Contact: ALAN PAINE

MIDLANDS & NORTH

021-742 4431

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Contact: STEVE WHITING

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For information and interview, telephone in confidence to Digby Dyke, Managing Director (evening charges if preferred) on:

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Two people are required with 1+ years experience of using FORTRAN on IBM mainframe using timesharing and batch in an engineering/scientific environment. Experience of IBM MVS TSO and JCL is essential. Also people with 1+ years experience of using structural analysis (Finite Element) software in a mechanical engineering environment. Experience of IBM MVS TSO and JCL is essential. Experience of NASTRAN or SORC SUPERTAB/SUPERB/FRAMESTAN is desirable.

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Several people are also required to join an existing group who specify, develop and implement engineering software on a variety of computer systems. Successful candidates can expect to spend part of their time in the Engineering Timesharing Support group above.

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Analyst/Programmer

up to £8,300 (salary award pending)

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CLOSING DATE: June 24, 1983

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Royal Military College of Science Associate Professor of Computing Science

The College runs first degree, post-graduate, army staff and special courses on a wide variety of subjects. While its primary function is the scientific education of army officers, the student population includes civilians and military personnel from overseas. It is a residential establishment occupying a large estate in the Vale of White Horse near Swindon and has an academic staff of over a hundred. There are extensive laboratories and workshops; and research is encouraged, and supported by a variety of outside sponsors.

An Associate Professor is now required because of a forthcoming retirement. As Head of the Computing Science Branch, the responsibilities include providing a computing service for the College; planning and providing the computing element in undergraduate courses in science and engineering; running courses in computing science and systems design at MSc, undergraduate and other technical post-experience levels; language development (eg ADA), structured design techniques, expert systems, local area networks and the application of simulation techniques to tactical and other battle training. The Associate Professor will build on the successful reputation of this Branch by growth in research and the applications of computing science and by the development of new teaching commitments in line with the rapid changes in technology of this discipline. Candidates should normally have a good first and higher degree in computing science or allied subjects and recent active experience in teaching the subject at all levels. The ability to manage and maintain computer systems is essential. Experience in designing courses and allocating resources to implement them is highly desirable. Further information about the post may be obtained from Professor M G Farley on Swindon (0793) 782551 ext 592. Salary will start between £15,000 and £18,505 according to qualifications and experience.

For further details and an application form (to be returned by 24 June 1983) write to Civil Service Commission, Alconon Link, Basingstoke, Hants RG21 1JB, or telephone Basingstoke (0256) 68551 (answering service operates outside office hours). Please quote ref: 959734.

05.07.1983

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Forward planning has identified a need to recruit skilled computer professionals to work within the User Support Group and a number of Operational Analysts are required. The User Support Group's activities are important and far reaching with involvement in both project orientated tasks and on going installation responsibilities. This latter area includes providing input on operational problems, testing and production JCL, efficiency of systems facilities and ensuring the operational influence on new applications.

Applicants must obviously be well versed in IBM operations support activities and possess a good JCL background, and whilst experienced Ops Analysts are preferred, consideration will extend to those wishing to move into this role. A possibility may exist for a highly experienced individual to assume a more senior role.

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MANAGEMENT & EXECUTIVE SELECTION

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£10K basic: on target earnings £30K TAX FREE

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The work will involve assisting in the planning and writing of application software and the liaison with users. In addition you will be responsible for the setting-up and maintenance of a range of microcomputer systems, and you should be a self-motivated person of proven capability.

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Candidates will be required to assist in the development and testing of an integrated network of relational databases which currently involves three distinct DBMS, running on a large minicomputer, a microcomputer, and a microprocessor system respectively. This network is a subset of the Proteus project, in which seven University research groups are collaborating to develop a heterogeneous distributed database, and there will be opportunities to take part in the work of this wider research group.

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Further particulars may be obtained from Dr. M. Finkel, Computer Science Department, Bristol University, Bristol BS8 1TW, to whom applications should be sent with curriculum vitae and names of two referees, by June 17th, 1983.

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Knowledge of DEC RPB11 an advantage. Preferred age 23+.

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ANALYST/PROGRAMMER

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RPG II**

**£9,500
+ MORTGAGE**

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Analyst/Programmer to participate in a VAX to IBM conversion. Extensive experience of COBOL and ADABAS is essential.

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IBM SYSTEM 38
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TANDEM
We require programmers who have worked with NS1/2. GUARDIAN experience preferred but not essential.

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We have two clients with requirements for programmers with extensive experience on Micro using either of these languages.

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COBOL CICS/DL1
We have a number of requirements throughout London and the Home Counties for programmers with in-depth experience in these areas.

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A long contract in the City is available for a consultant to recommend and install a Database for a merchant bank.

IBM SYSTEM 34
Our City client requires a number of analyst/programmers with an in-depth knowledge of Banking, preferably with MIDAS.

PL1 CICS
We have several requirements for senior programmers in London and the Home Counties.

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OUR CONTRACT REQUIREMENTS ARE CONSTANTLY CHANGING AT SHORT NOTICE. PLEASE TELEPHONE 01-439 1866 FOR FURTHER INFORMATION

REED computing

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Share in continued growth of this successful company. Using DEC VAX/PDP/II you will be working on application systems for turnkey projects with considerable customer contact. Your drive, ideas and enthusiasm will be well rewarded. Ref: 01112.

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This major manufacturer offers broad systems exposure on continually improving hardware and software in addition to a defined career path with the promise of overseas travel. Utilise on-site squash courts, bars, video room. Ref: 01118.

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As member of small specialised team you will deal with commercial projects encompassing transport and production needs for internationally-known group. Your future holds Team Leader and Project Manager potential. Non-contributory benefits plus profit share. Ref: 01107.

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SYSTEMS PROGRAMMING CONSULTANCY

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Applied Technology's Systems Programming Group has a number of vacancies for personnel who are experienced in either DOS/VSE or MVS Systems Programming to work in the UK, Europe and Middle East.

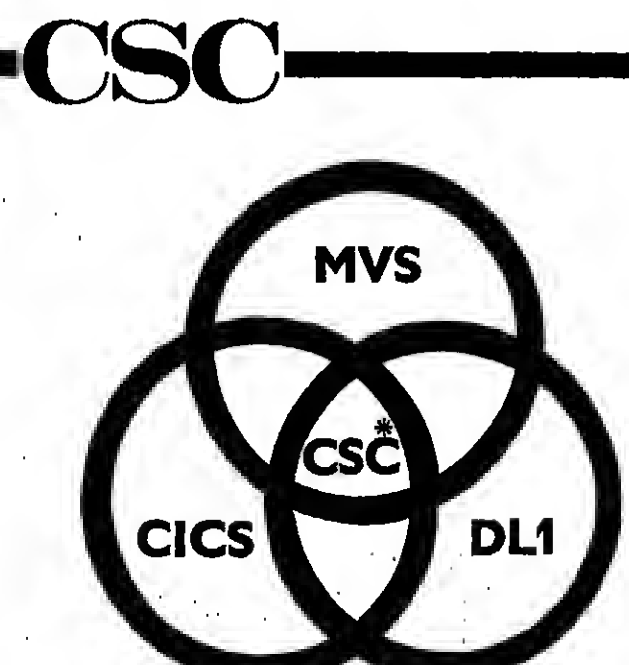
Prerequisites for these positions are:

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All positions are on a permanent basis offering an attractive salary and a comprehensive benefits package.

In the first instance send either a full Curriculum Vitae or telephone Peter Gifford, Applied Technology Limited, Landway House, 32 High Road, London E18 2QL. Telephone 01-530 63

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Systems and Software Engineering
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*With the right IBM experience you can be in at the start of a new group set up to support nationally known Fujitsu and IBM projects - and advance your career with the world's largest hardware-independent systems company.

The vacancies are for systems programmers, from senior management consultancy through responsibility for planning, procedures, standards and operations to database programmers. Location: London/Home Counties.

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Required for long-term involvement in the development of a new computer system. The successful candidate will be responsible for the overall management of the project, including the selection and supervision of staff, the procurement of hardware and software, and the coordination of the project with other departments. The position offers a competitive salary and a comprehensive benefits package. Ref: 01113.

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The candidate should preferably hold a post-graduate degree covering control engineering, mathematics and computing, together with relevant research experience. The appointment is initially for a period of three years, with a starting salary in the range of £8,000 to £12,000 depending on qualifications and experience.
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S.E. PERKS

Our client, a highly successful industrial control specialist is expanding. Large dual computer systems with colour graphics and specialized micro-processor interfaces are extensively used.

This continued expansion has led to a further need for a team leader and analyst programmer.

For the more senior position you must have at least 4 years real-time experience using Macro 11 and a block structured language. Familiarity with RSX11M is essential. In addition a knowledge of INTEL or ZILOG equipment would be advantageous. Analyst Programmers will have at least 2 years similar experience.

You will enjoy access to an abundance of the latest development equipment, good career prospects, frequent user liaison and work in a small friendly community.

For further details telephone Keith Taylor at our Reading office or write sending a full C.V.



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SENIOR IBM SYSTEMS PROGRAMMER

WEST MIDDLESEX
c. £13,500 + PAID BENEFITS

Our client, a highly successful international company is seeking a Software Programmer with around three years' experience. Sound knowledge of MVS/JES 2 and CICS/DL1 on IBM 4341 Hardware is essential whilst familiarity with VTAM/NCP would be advantageous.

The company offers continued development work within a friendly, professional department in addition to excellent working conditions, security and good benefits. These include private Medical Scheme for self and dependants, 23 days' annual leave and subsidised restaurant.

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£40K+ 1ST YRS EXPECTED EARNINGS
£65K+ 2ND YRS EXPECTED EARNINGS

Our client is one of the most successful computer and office automation equipment manufacturers in the world. With offices throughout the U.K. the company is renowned for its positive and successful approach to the marketplace.

Significant in its contribution to that success is the insurance and banking division based in the city of London. In 1982 every salesman in the group exceeded the targets which were set. To join this division we are seeking to recruit exceptional salesmen who can cope with demands which a very successful company makes upon its sales force.

Ideally you will have a successful sales career with experience gained in the banking or insurance sector. This experience is not essential however and the required attributes are the ability to demonstrate a good career to date selling D.P. or W.P. products combined

with the ambition and ability to be even more successful.

Those who are successful in their application will find themselves working in an environment which is totally geared to helping salesmen over achieve. They will have the widest range of products available, and will be supported by a technical and administrative team whose enthusiasm is matched only by its competence.

For a professional salesman in the computing industry the chance to join the insurance and banking division of one of the most successful computer and office automation manufacturers in the world must represent an outstanding opportunity.

If you recognise this opportunity and have the necessary history of sales achievement to support your application contact Kevin McCourt on 01 439 6288 to arrange an early interview.



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COBOL/CICS/DL1 City of London

International Bank

This major, international bank is developing a new, on-line banking system in the following interactive environment: IBM 4300, CICS/DL1, VM/CMS, DOS/VSE, VSAM, using structured programming techniques.

The company promotes from within; wherever possible and training is given to enable staff to develop their expertise in readiness for promotion.

Salaries are good and enhanced by generous benefits which include:

- 5% mortgage
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Please contact Joan Ainsworth on 01-681 8311 or write to her at: C.S.S., 6th Floor, Caralyn House, Dingwall Road, Croydon, Surrey, CR0 9XR

Senior Programmer to £11,500

For this position a very good knowledge of DL1 and CICS is required, together with the ability to assume responsibility for the work of a small number of programmers. Program design responsibilities will be mostly on-line but batch experience is also required.

Programmer to £10,000

DL1 is essential for this position, preferably coupled with CICS (but training in the use of CICS will be given where necessary). A minimum of one year's programming experience is required.

Computer Search & Selection (Southern) Ltd



CALMA IS A LEADING MANUFACTURER OF COMPUTER GRAPHICS SYSTEMS
The European Customer Services Department has vacancies in the Software Projects Department for the following positions:

SENIOR SOFTWARE ENGINEER (DEVELOPMENT)

The person will be responsible for design and development of software to meet special application requirements of European clients. A minimum of four years' experience of Computer Programming in an Engineering environment is required. Experience of Fortran is required. Experience in Design/Coding or use of CAD/CAM Systems for Mechanical Engineering would be an advantage.

SENIOR SOFTWARE ENGINEER (OPERATING SYSTEMS)

The person will be responsible for giving advice and support to Calma personnel and customers across the range of Calma Computer Systems. Experience in the use of VMS is essential. A minimum of four years' experience of the use of computers in an Engineering environment is required. Experience in one or more of the following areas would be an advantage.

COMMUNICATIONS

CAD/CAM
NUMERICAL CONTROL
FINITE ELEMENT MODELLING
DATA BASE DESIGN AND IMPLEMENTATION

SENIOR SOFTWARE ENGINEER (COMMUNICATIONS)

The person will be responsible for giving advice and support to Calma personnel and customers on the Communications software available to link Calma systems, both to each other and to other mainframe and mini-computers. A minimum of four years' experience of the use of computers in an engineering environment is required.

SOFTWARE ENGINEERS (DEVELOPMENT)

People are required to work on a variety of projects commissioned by clients. These projects extend the range of applications which can be addressed by DDM. The Calma three dimensional modelling system for Mechanical engineering. A degree in Computer Science or engineering is required. Experience of Fortran would be an asset. Salary is negotiable according to experience, and benefits include free membership of BUPA, a contributory pension scheme and over four weeks' annual leave.

Please contact Robin Mills for an application form:



calma

CALMA COMPANY
Beech House, 273/288 London Road
Camberley, Surrey GU15 3HR
(0276) 882021

SOFTWARE SERVICES MANAGER

to £18K
+ Bonus

HERTS

Our client is a world leader in the research, development and manufacture of prescription medicines. Their continuing commitment to growth and research and development has resulted in the formation of the Research Computing Department to provide technical expertise and appropriate data processing knowledge in the development of computer systems to the research departments.

A software services manager is required to lead an expanding group which develops and supports existing and new systems and proposes computer solutions to scientific problems.

The successful candidate, a graduate, will have a good appreciation of computer capabilities, experience of a variety of hardware, including sound understanding of the DEC range of machines, be able to communicate effectively and show flexibility in problem solving.

The company, which is set in 39 acres of landscaped country estate, offers generous fringe benefits including an annual bonus.

For further information please telephone Keith Taylor or write enclosing a full C.V. to our Reading office.



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Telephone 01-439 6288

CUSTOMER ENGINEERING

PARALYSIS would soon cripple the entire business world without the services of the people who tend and adjust computers - customer engineers.

The term customer engineer seems to be preferred to such alternatives as maintenance engineer because it indicates an important element of the job: the engineer is there to look after the customer.

"The field engineer must be able to go in, soothe ruffled feathers and fix the problem quickly," said Mike Hill, a recruitment consultant at All Executive who specialises in customer engineering jobs.

What is the nature of the customer engineer's job in 1983? Often it is to simply replace a faulty module, this being the most expedient way of getting the machine running again. More extensive fault finding and repair is left to in-house engineers at the branch or centralised workshop.

The job title customer engineer refers to a range of jobs almost as diverse as the equipment to be maintained. It includes in-house engineers who may be called to customer sites to provide technical support if the field engineer cannot solve the problem.

Paul Whiteley, ICI's manager of organisation and manpower for the UK divi-

The computer healers

Margaret Spooner on the saving graces of maintenance men

sion, suggests that the role of the traditional customer engineer is becoming separated into two areas: "There is a requirement for high calibre technically oriented people to go into top flight jobs which may combine both hardware and software support."

These will generally be graduate recruits.

Whereas many companies are now seeking graduates in an appropriate discipline for top level technical support jobs the qualifications for recruits to the second category are more varied. For example, independent maintenance company Data Processing Customer Engineering (DPCE), an independent maintenance company, currently takes on four or five recruits a month with a balance between experienced personnel and trainees.

Jan Craig-Grant, DPCE's engineering director, said that suitable trainees come from a variety of backgrounds: they may have O/A level maths or physics or an HNC or HND qualification; some are from the forces with experience or radar or



The field engineer should soothe ruffled feathers.

radar and others may have worked on Post Office switching equipment.

"What we look for is the bright person with a natural ability to fix computers.

There is an element of luck in this but if they have the ability they can progress quickly."

A TBC (technical education certificate) is another

suitable qualification for potential trainees.

Whether they join a manufacturer or an independent maintenance company new recruits can expect to

receive classroom training on the products they will maintain and tuition to instil good customer relations skills.

Usually, several weeks of classroom training would be followed by on-the-job training alongside an experienced engineer after which the recruit would be assigned to maintenance of a product.

Having spent two or three years with their first employer some recruits move to widen their experience or gain promotion. Those in-house engineers who think they will enjoy dealing with customers may seek field service jobs with a company car and expense account but there are more people seeking such jobs than vacancies, according to Mike Hill, and the transition can be difficult as employers usually look for experience with customers.

Some companies seek a balance between experienced and raw recruits but many prefer to find staff who already have a couple of years experience.

Hewlett-Packard and a number of manufacturers including Digital Equipment and Data General in conjunction with City of London Polytechnic devised a two year course on which they sponsor 25-30 students each year.

A different type of training is required for engi-

neers maintaining computers used in industry, for example, in process control or online production control systems.

Jim Dick who looks after the Engineering Industry Training Board's microelectronics and computer training programme, said that maintenance engineers for such systems need to understand the environment in which the computer is used as well as electronics.

The Board runs two types of pilot courses: they train experienced staff who have previous knowledge of electronics and they provide training for newcomers to OND level with a broad base in electronics.

Once an employee has reached the level of senior customer engineer the career paths are open to him. John Cunliffe, Data General's personnel manager for the UK and Ireland, outlined Data General's fairly typical career structure.

Customer engineers' salaries range from about £8,000 to anywhere between £20,000 and £30,000.

But anyone entering the field of customer engineering should note one further pre-requisite for success. It is the ability to adapt to changing circumstances. Already changes in procedures for maintaining computers are leading to possible new career patterns.

Support Professionals... lead the way with a major pacesetter in integrated office technology

STC Business Systems is a company powerfully geared to the rapidly growing electronic office market; producing an unusually broad range of cost-effective voice, data and record systems capable of integrating entire business operations.

Now with increasing activity we're looking for the following additional customer and product support specialists to join a top level technical support group:

Front-end Processor Software Support

Three Customer Support Engineers are required, one to be based in Bristol to handle new business expansion, one to join an established team in Manchester, and one to join Support Group HQ in North London.

The main tasks will be to help and advise customers in the use of software for IBM-compatible programmable communications controllers, to install software at new customer sites, and to respond to customer-reported software faults.

Applicants should have a background in VTAM/NCP systems programming in a large IBM environment and have a good knowledge of one or more of the following: EP/ACE/NCP, MAF/SRM or NTO, plus experience of Assembler. For the Bristol-based post, applicants must be capable of solving complex problems with minimum assistance and have strong communication and interpersonal skills.

Visual Display and Hard Copy Systems

Two Product Specialists are required to support a comprehensive range of IBM-compatible data terminals. These are high level positions calling for tact and diplomacy and an ability to carry out discussions with senior customer management.

Applicants must have at least 2 years' relevant systems engineering experience, ideally on IBM 3270 or personal computer systems. Some travel will be necessary possibly spending up to 2 days away at a time.

STC Business Systems

Front-end Processor Systems

A Product Specialist is required to support the 380X range of programmable communications controllers. Activities will include working on-site with customer senior technical management and field-based support staff; high level interfacing with suppliers; and vetting the applicability or feasibility of proposed enhancements and engineering changes.

Applicants must have extensive IBM systems programming experience, preferably on IBM 3705, and a thorough knowledge of VTAM and NCP.

Distributed Data Processing Systems

Two Product Specialists are required to provide high level support to the 3480 Distributed Data Processing cluster system, currently marketed only in Continental Europe. This will involve answering queries and solving problems by telephone, posed by foreign customers, marketing and technical personnel in the field. Some travel may be necessary to European centres for presentation and training purposes.

Applicants should have a strong software bias and experience of either IBM systems in a communications environment or of personal computer microsystems. More important, however, is versatility and enthusiasm and a willingness to fill in any gaps of knowledge. Foreign language ability would be an advantage.

Word Processing Systems

Three Product Specialists, one with a strong software bias, are required to provide high level technical support to the ITT 3100 Scribe multifunction word processor series. This could eventually lead to diversification into teletext/electronic mailing systems.

The software oriented specialist should have a good knowledge of Intel 8086/8088 Assembler; implementation of CP/M and CP/M-86 operating systems; communications protocols; and some experience of word processing packages.

For the other positions a background in field engineering involving modifications to hardware and firmware would be ideal, preferably backed by an interest in software.

Facsimile Transmission Systems

A highly experienced fax specialist is required to provide high level support to field engineering and marketing departments handling an advanced range of CCITT Group 2 and Group 3 systems. Activities will include liaison with manufacturing departments and suppliers; identification of design problems and input to design amendments.

Applicants must have a sound background in fax and copier systems plus extensive knowledge of communications protocols and firmware modification.

These positions - all based in North London except where we have indicated otherwise - offer an extremely high degree of interest and variety, with on-going training and the chance to move to new generation products as they become available or to other support areas within the group.

Rewards include competitive negotiable salaries, company cars, 5 weeks holiday, first-class benefits, and an excellent relocation package covering all major expenses.

If you are interested in helping us set the pace, phone Hazel Johnson now for an application form on Brighton (0273) 507111 Ext.3210 or write to her with a full cv, stating which position you are applying for, to STC Business Systems, Lion Buildings, Crowhurst Road, Hollingbury, Brighton, BN1 8AN.

STC

Network Engineer with mini/communications hardware experience

United Information Services is one of the world's leading computing services organisations. A young and dynamic company, one of our major strengths is a powerful remote interactive and batch computing service based on Data Centres in the UK and USA, linking our on-line clients via UNINET, our own worldwide communications network.

We can offer considerable scope for career progression to the Network Engineer who is now needed to join one of the small specialist teams based at our City head office. With us you'd be responsible for the day-to-day running of the UNINET system, making occasional field trips on a countrywide basis in order to install, fix and relocate equipment and resolve network and hardware problems.

If you are qualified to ONC/HNC level and have had both mini (DEC PDP11/34 preferred) and peripheral or communications hardware experience, you can qualify for an initial reward package which includes a salary around £9000 p.a. plus shift bonus.

Interested in a future linked to the effective use of advanced computer technology by a major company? Then contact: Helen Gardiner, Personnel Director, United Information Services Limited, United House, 56/64 Leonard Street, London, EC2A 4AN. Telephone 01-253 1066.

UNITED INFORMATION SERVICES

Lion Systems Developments, currently Britain's number one manufacturer of Data Communication Systems and products, are expanding their operation to include a brand new purpose built Headquarters, situated at the edge of the Chiltern Hills, adjacent to junction 8 on the M40 in the village of Stokenchurch.

Sales Support Engineers

To select the field sales force in the engineering aspects of our Systems and Products. Previous experience in the Data Communications industry would be a definite advantage. There are excellent prospects for promotion to the external Sales Force. We offer a highly competitive salary, free BUPA membership (after qualifying period), generous holiday arrangements and an active Sports and Social Club. Find out more about these valuable career opportunities by contacting Moira Ogle, Personnel Officer, Lion Systems Developments Ltd, Oxford Road, Stokenchurch, High Wycombe, Bucks HP14 3BX. Tel: Redgrave 3951.



LION SYSTEMS DEVELOPMENTS Data Communication Products Systems Design and Manufacture (1983)

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1. Salesman/Manager required to set up and develop professional sales department. A successful track record of Data General experience essential.
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1. Free housing and return tickets to UK.
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with full cv including a recent photograph

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See our Audio/Visual presentation then talk to us about the future.

We are the UK Headquarters of General Electric (USA). Here at Radlett we design and manufacture high value medical diagnostic imaging equipment, including the Body Scanner.

As the products we manufacture become more electronically complex we need to further strengthen the manufacturing/engineering technical interface. This is the major task for the

MANUFACTURING ENGINEERING MANAGER £12-15K range

The ideal profile for this role is: Electronics graduate or equivalent with a minimum of 7 years involvement in the process of transferring projects from the Design and Development stage into manufacturing. An understanding of test philosophies, circuit design and project planning is essential. Equally important is a balanced management style where continual prioritisation of tasks and activities is second nature.

A recent reorganisation coupled with a continuous increase of technical sophistication of new product means we have created the position of:

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Ideal candidates should have a good technical education, Electronics Degree or equivalent, with a sound management experience possibly gained at the team or section leader level. Technically this is a demanding position with the latest application of microprocessors being used.

We would expect you in the last 5-7 years to have achieved sound career progression gained in a "complex computer controlled equipment" environment.

In addition we have vacancies in these Departments for more junior positions, i.e. Section Leader or Senior Engineer.

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call in at: YE OLDE CHERRY TREE
22 The Green, Southgate N14 6EN. Tel: 01-886 0248
on: TUESDAY 14th JUNE 1983
between: 4 pm - 9 pm

INFORMAL DISCUSSION INVITATION
call in at: THE SAXON INN
Southern Way, Harlow, Essex. Tel: Harlow 22441
on: WEDNESDAY 15th JUNE 1983
between: 4 pm - 9 pm

or, if this is not convenient please telephone or write to: David J. Lunt, Personnel Manager,

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INTERNATIONAL GENERAL ELECTRIC COMPANY OF NEW YORK LIMITED

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JUNE 16 ISSUE

COMPEC NORTH '83 RECRUITMENT SPECIAL TO COINCIDE WITH COMPEC NORTH!

Belle Vue, Manchester June 21-23

Compec North was launched in 1981 to serve the demand for a well-organised, well promoted, professional show in the computer-conscious North. Its success and growth over the past two years is evident from the reaction and interest already shown by exhibitors in the '83 exhibition. Their demand for space this time is greater than the two previous years.

To coincide with Compec North the June 16 issue of Computer Weekly will contain a special recruitment feature covering the computer job market in the Midlands and North of England. Topics covered will be relevant and written by industry experts and staff writers who will report on the current job scene for skilled computer people in this important and expanding area. This issue will be distributed in the normal way to all Computer Weekly

readers throughout the U.K., and will also be available to visitors from the Computer Weekly stand at Compec North.

This issue is perfect for recruitment advertisers — the editorial environment is right, the target audience is captive, and as Computer Weekly has a total circulation of over 97,000 copies every week, advertisers can be sure their advertisements will be read.

To reserve space in this special feature
Phone (01) 661 8080 today.
Copy deadline is Monday June 13.

*97,226 ABC July-December 1982

ComputerWeekly

Quadrant House, The Quadrant, Sutton Surrey SM2 5AS
Compec North is sponsored by Computer Weekly

Computer Operator East Africa

Belfour Beatty Construction requires a Computer Operator for a major construction project in East Africa.

Candidates should have experience of DEC PDP11 equipment and have the ability to make limited amendments to existing programmes using Fortran or Basic. The ability to provide first line maintenance would also be advantageous. Additionally previous supervisory experience is desirable, as the job will require the supervision and training of local operators. This is a single status position with 21 days' UK leave after 6 1/2 months overseas.

Please apply in writing detailing your experience to Senior Personnel Officer, Belfour Beatty Construction Ltd., International Construction Division, Randolph House, Wellesley Road, Croydon, Surrey CR9 3DD.

BB Balfour Beatty

NICK GILL

I am setting up a new computer contract staff agency in the Thames Valley which will be part of one of the U.K.'s leading agency groups. To do this I will need the help of some enthusiastic individuals to establish the following divisions:

- Programming
- Operations
- Key Punch

Please telephone Nick Gill at home after 6pm on Ascot (0890) 20621

All replies will be treated in the strictest confidence

COMPUTER OPERATOR London Bridge

BBC Publications produces Radio Times, The Listener and a wide range of educational literature. We need an ICL 2904 operator (at least 12 months experience) to work in our Computer Services Department. Knowledge of communications and education to 'A' level standard desirable. Must be prepared to accept responsibility. Salary £1755-2177 according to qualifications and experience (currently under review). Relocation expenses considered. Contact us immediately for application form (quote ref. 2586/CW and enclose s.n.c.) BBC Appointments, London W1A 1AA. Tel. 01-580 4468. Ext. 4619.

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BBC
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MICRO COMPUTING ANALYST CROYDON

Salary up to £9,500 p.a.

UAPT the leader in the finance and business service sector is at the forefront of information technology extensively using main frame and micro computers.

A vacancy has arisen for a micro computing analyst to specialise in the technical and design aspects of the personal computing environment. The position requires someone with the ability to liaise with in-house users who can develop and provide sound support to the business systems team. Growth is foreseen in the application of micro computers alongside a large main frame.

Relevant experience of BASIC and micro computer systems such as DMS or D. Base II is required.

There are likely to be career opportunities in project management and general management for the right candidate.

If interested please write with brief c.v. to:

Mrs Maureen Kilminster, Personnel Manager, UAPT, Zedco House, 163 London Road, Croydon, Surrey.

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The Automobile Association has over five and a half million members. In addition to its renowned services for motorists it can boast involvement in a variety of other activities: Comprehensive Insurance Broking, even including a Mortgage Protection Scheme; Travel — it has one of the UK's leading ABTA travel agency chains with 50 outlets; Overseas Travel Protection — it even has its own air ambulance for the repatriation of members taken ill; it is one of the UK's leading Cartographers; it is high in the list of leading book publishers.

Programmer to £10,000

If you are team-orientated and have a flexible attitude towards your work then this position offers the opportunity to develop your career within a forward-thinking department. Your experience will include two years ICL COBOL, under VME. Knowledge of SCL and the use of DDS would be a definite advantage.

Senior Programmer to £11,500

This is very much a dual position. Leading by example, you will be responsible for supervising a small team of programmers as well as scheduling, specifying and programming using COBOL. You will have a background of 3-4 years COBOL programming in an ICL VME environment coupled with experience of designing SCL procedures and approximately 1 year's supervisory experience. Also advantageous would be a knowledge of IDMS DDS and transaction processing.

These positions are located in the Automobile Association's headquarters Fanum House, Basingstoke, Hampshire. Fanum House is a modern office building offering first class working and social conditions. Additional benefits include:

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For more information please ring Janet Chilvers or Sandra Harsh on the office numbers, but if this is not convenient they will both be pleased to talk to you outside working hours. Janet can be found on 01-765 7615 and Sandra can be contacted on 01-458 6988. Alternatively post the coupon today — no stamp needed.

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You will have total responsibility for your projects, designing, writing, testing, running and maintaining and documenting the programmes under a timeshare agreement with another company. Additionally, you can expect to become involved in special DP and EDP projects and perform Data Control duties.

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The contract is offered on bachelor status with all living expenses and local taxes met by the company. Based in Tripoli, with its pleasant Mediterranean climate and modern facilities, you will work 6 weeks on and 2 weeks off with Tripoli/London air tickets provided free.

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Please contact: Paul Macklin, Personnel Department, Centre-file Limited, 75 Leman Street, London E1 6EX, Tel: 01-488 3131, ext 3958, giving full details of your career to date, or alternatively requesting an application form.

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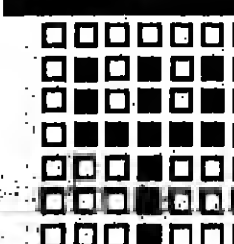
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One of our most respected clients, a major Insurance company, offers a unique career opportunity for a Programming Team Leader to take control of new project developments. This will encompass setting up standards and procedures and quality control of technical design and programming.

You should be able to prove your extensive IBM COBOL Programming expertise in a DOS environment with CICS and DL1.

Two Programmers are also required to supplement their programming team currently developing an on-line data-base system. If you have two years' IBM COBOL Programming experience with CICS and DL1 and seek the opportunity to widen your career potential, telephone our Consultant quoting Ref: J115.

If you believe your experience matches any one of the above criteria, then light up your future by contacting: Fred Bramley (Sales) or Peter Jezeph on Fernborough (0252) 516141 or write enclosing a detailed cv.



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**ANALYST/PROGS
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Several exciting opportunities have arisen for persons with strong programming backgrounds and proven analysis skills to join a major international software house, based in the City. Their expansion opens new positions in development and support roles with their banking client base utilising the latest VAX and PDP equipment. A financial systems background is desirable and banking expertise would be of special interest. At senior levels management and pre/post-sales vacancies are immediately available.

**VARIOUS LEVELS
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We have been retained by a number of ICL users in London and the Home Counties to find experienced systems and programming staff. We wish to talk to Programmers and Analyst/Programmers with at least 18 months' COBOL experience working with ICL 2900 and ME29 equipment. Analysts should have at least one year's formal analysis preferably with a COBOL background. Applications from persons living outside this area are welcome as company benefits include relocation packages.

**ANALYST/PROG
DEC/VAX****c. £9,500**

Our Client, a City stockbroking company with recently installed VAX equipment, is seeking an experienced BASIC Analyst/Programmer. They require at least two years' programming on Digital equipment and would be very interested in applicants with some VAX exposure. Salary and prospects are excellent and a valuable benefits package is offered which includes a high guaranteed bonus scheme.

**PROGRAMMER
RPG II****£8,000**

Applicants with at least one year's RPG II in a 34 environment are invited to apply for this post. The company is a subsidiary of an international group with a small DP department based in the City. The work would involve a range of projects to include financial, personnel and marketing. Good training would be offered including formal Analysis course.

**ANALYST/PROGS
PL1****£11,000**

Applicants should have at least two years' PL1 in a commercial/manufacturing background. The Client is an established and progressive user with the DP centre based West of London. Not only should applicants have strong user skills they should also have good management potential since the client regards all successful candidates as future managers. There is a full relocation package available.

**PROGRAMMER
RPG III TRAINING****£8,750**

North Surrey based company has identified a requirement for an RPG programmer. They are an established 38 user and have ample in-house expertise to give full 38 training to existing RPG programmers. The minimum requirement is at least 1½ years' RPG II programming, preferably from a 34 environment. As well as full 38 training, the client encourages early exposure to systems.

**ANALYST/PROGS
COBOL/FINANCE****c. £10,500**

Two C. London based financial concerns require Analyst/Programmers to join their teams. Applicants should have in excess of two years' COBOL gained in either a financial environment or on BURROUGHS or NCR hardware. The successful candidate will have leadership potential as a move into a junior management position is expected. Excellent perks include full banking benefits, annual bonus and overseas travel.

**PROGRAMMERS
BURROUGHS****to £10,000**

Programmers with 18 months' BURROUGHS CMS experience are required by Clienta based in Central and to the West of London. With both companies there would be a considerable amount of client contact and candidates must therefore be professional in both appearance and attitude. Excellent career prospects and working conditions are suggested by perks which include the possibility of a company car in the future.

**SALES SUPPORT £NEG+ CAR
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A well-known manufacturer requires experienced DP personnel to join their expanding sales support teams. Applicants should have a good academic background, a minimum of 18 months' commercial programming and preferably had some user/client contact. A financial background would be useful but not essential as the company is committed to extensive and continuous training of all employees. This is an excellent career opportunity for ambitious people who wish to move into a sales oriented position.

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Work is carried out in a small team environment supported by impressive first computing facilities and working towards bringing in the software on time and within cost. There are good opportunities for further career development.

Salaries will be negotiable and accompanied by a first-class benefits package. Relocation assistance will be provided where appropriate.

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**IBM PROGRAMMER &
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CITY-BASED £9,000-£12,000
+ benefits**

Leading international Bank, with offices in over 20 countries, require a Programmer and an Analyst/Programmer, with upwards of 2 years IBM COBOL (4300, DOS). Both positions require some knowledge of On-line and Database techniques, however, a background in International Banking would suffice.

**ICL COBOL PROGRAMMERS
CITY/SUSSEX £7,500-£9,000**

Career going nowhere? This International concern are right now reviewing their d.p. requirements. Their dual ICL 2950's currently run under DME/3, but they are looking at VME and IDMS, and are even considering IBM systems. They now wish to recruit 2 ambitious programmers with 1-2 years ICL COBOL and FILETAB experience.

John Watkinson
Home Tel:
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**PL/1 ANALYST/PROGRAMMERS
CITY c.£11,000+**

Leading financial concern wish to continue their expansion drive by the addition of further Analyst/Programmers, or Programmers Interested in moving swiftly towards analysis and design areas. Essential qualities are 2 years + PL/1 experience and some tangible record of achievement in your career.

**IBM SYSTEM 34/38
LONDON/H. COUNTIES/
ABROAD**

£9,000-£16,000+

No average jobs! The wide range of career-oriented opportunities for good RPG-2 and/or RPG-3 experience currently includes: Consultancy roles, Retraining onto System 38, Worldwide travel, Mortgage and Financial benefits, and Management-level positions. Don't hesitate - call now to match your skills with our Client files.

**ICL SENIOR PROGRAMMERS
BERKS/HAMPS**

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Either large (ICL 2960 IDMS) or small (ICL ME29 MTS) experience required to secure positions within these two progressive organisations. One client requires 3 years ICL COBOL, ideally stock control and order processing while our other client, who will be recruiting 6-7 additional staff, expects candidates with 2-5 years exp. to work on a variety of new development projects.

**PL/1 PROGRAMMERS &
AN/PROGRAMMERS
LONDON/H. COUNTIES to £13,000**

Large IBM installation, running under MVS, are seeking several Analyst/Programmers with solid PL/1 backgrounds, ideally including CICS and Database skills. Similar positions also exist throughout London and the South East for PL/1 (and ASSEMBLER) professionals with upwards of 12 months experience.

**IBM PROFESSIONALS
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**IBM COBOL
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Is working in a Batch environment getting you down? Would you like training in CICS & DL/1? If so, then read on... We have several Clients based throughout London and the Home Counties who would be interested in hearing from any bright young programmers with upwards of 9 months IBM COBOL experience, DOS or OS/MVS.

**ANY COBOL
LONDON c.£9,000+ mortgage**

Retraining offered for good COBOL programmers with 2-3 years commercial experience gained on any hardware. Positive personality and leadership potential are essential qualities for candidates who wish to secure important positions within this progressive organisation.

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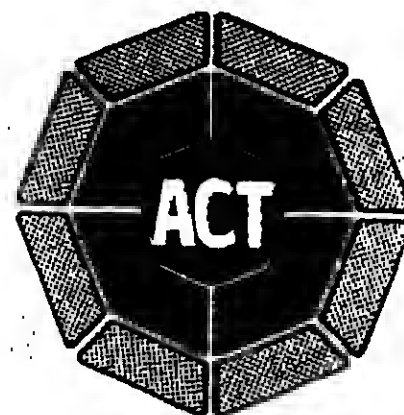
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We have two DEC 11/70's and a linked-in IBM 3033 mainframe, which runs under MVS with IMS/TSO/SPF.

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Please write to or phone Sheila Cornwell, Personnel Department, Hotpoint Limited, Peterborough, PE2 6JB. Tel: 0733 88889, Extension 142.

(4051)

Hotpoint

**IBM ANALYST/PROGRAMMER
(NEW INSTALLATION)**

CITY c. £12,000

Our client, a prestigious financial management organisation who currently utilise the service of a bureau, now wishes to recruit their own in-house COBOL Analyst/Programmer who has around 4 years' experience, of which 2 years has been spent in Systems Design, writing interactive applications, liaising with users, and using IBM DATA BASE TECHNIQUES.

Your initial task would involve working with the service team on completing their current financial system, which would eventually be moved in-house to run on their IBM 4341 using CMS/VM, and from then on, design, develop and maintain other financial systems as required.

As well as a proven technical background, you must have the ability to produce VERY HIGH STANDARDS OF DOCUMENTATION.

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(4066)

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ICL 2900, VME COBOL IDMS PROGS
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IBM 4300, OS/MVS, COBOL & ASSEMBLER ANAL/PROG
IBM 4300, OS/MVS TSO COBOL AND/OR MARK IV
DESIGNER/PROG

IBM, IMS, COBOL PROGRAMMERS
IBM, IMS DATABASE & MSS ANAL/PROGS
IBM, SHADOW 2 COBOL PROGRAMMERS
BURROUGHS 6800, GEMCOS COBOL PROGS
BURROUGHS 6800, GEMCOS, COBOL DMS II PROGS
UNIVAC 1100 EXEC 8 FORTRAN PROGS
VAX, VMS COBOL PROGRAMMERS
VAX, VMS COBOL DECNET AND/OR DBMS SENIOR PROGS.
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TANDEM, GUARDIAN COBOL ANALYST/PROGS
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Contact Lorraine on Walton-on-Thames (98) 45552 (Evenings/Weekends)

PERMANENT

IBM ANALYST/PROGRAMMERS West London c. £13,500

We urgently require people with four to five years' experience in an IBM on-line environment. Candidates should have either PL/1 or COBOL as the major language and must have held responsible positions with large project teams. Future growth will offer excellent opportunities for the right people to pursue long-term careers with this international company.

The modern offices, that are easily accessible with ample car parking facilities, offer excellent working conditions and company benefits provide the right incentives for prospective candidates. Ref. 257

PROJECT LEADERS West London to £12,500

An expanding software house is looking to develop its middle-management team - you should have around five years' experience on HP3000 kit using Image, Query, View etc. The last two years will have been in project management and you will have seen at least one major project through to implementation. Candidates who can demonstrate above average commercial awareness will also get a company car. Ref. S2000/CW

DEC SYSTEMS SUPPORT c. £10,500

A London based bureau - running client business on mainframes, minis and micros - is currently looking for a DEC Systems Programmer. You will be responsible for hardware installations and software upgrades and for supplying a hot-line service to users. The future plans of the bureau will involve you in setting up a total communications network. Ref. S3001/CW

PROGRAMMERS to £10,000 + benefits

This major international bank is currently looking for additional young COBOL/RPG II programmers to strengthen the existing team. You will work on twin IBM 4341's running VM/SP and MVS in both batch and on-line systems. Previous experience of banking or insurance systems is essential for those wanting to take immediate advantage of the excellent benefits package. Ref. B372/CW

PROGRAMMER/ANALYST c. £9,000

A major multi-national capital equipment manufacturer is looking for a young Programmer/Analyst for their West London headquarters. You will be responsible for the day-to-day control of the PDP-1170 - and for ensuring that user problems and queries are sorted out quickly and efficiently. You should be capable of liaising with all levels of management, and be looking to grow into more of an analysis role. Recent hands on experience of DEC hardware using DIBOL is essential - knowledge of RSTS/E is preferred. Ref. B353/CW

IBM SYSTEMS PROGRAMMERS Saudi Arabia

A software house urgently requires experienced DOS/VSE, CICS people to join their permanent staff. The first assignment will be in Saudi Arabia and subsequent posts could be in Europe. Ideal candidates would be single people who enjoy hard work, travel and want to retire early. You will be paid a UK based salary with related allowances for the country to be visited. Ref. 370

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Systems Programmer (MINI/MICROS)

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As a result, the Company now wish to make an additional key appointment, within their small specialist team, and are seeking to recruit a candidate possessing experience of systems software, encompassing specifically, operating systems and languages, gained within a mini or micro environment. Whilst experience in any of the following - MS-DOS, CP/M/86, UNIX, PASCAL, - would be most welcome, it is not essential, overall ability being more important.

As you might expect, with such a prestigious Organisation, terms and conditions of employment are excellent, and benefits will include a fully supported Company car, and generous relocation assistance, if required.

This position undoubtedly represents a considerable challenge and scope to an enthusiastic and career minded individual, and an unrivalled opportunity for personal and career advancement within a thoroughly professional and dynamic Organisation.

Occasional overseas travel is envisaged.

In the first instance, please contact our Advising Consultant, **Peter Lees**, on **021-236 3781** (24 hour answering service) or **0902 832141** (evenings and weekends).

Interviews in Birmingham, London and Manchester.

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Consequently, we seek to appoint a Systems Quality Audit Manager to monitor and uphold the quality of systems and adherence to standards, and with an ambitious systems development plan about to commence, this position is of utmost importance to the Company.

The successful candidate will have a strong DP background, possibly encompassing Applications and Operational

areas, and will be capable of communicating with Managers, departmental staff, and users, with a high degree of tact and diplomacy. A good awareness of project and budgetary control, together with sound experience of report writing will obviously be required. Familiarity with BIS standards within an IBM environment would of course be ideal, but consideration will be given to those possessing suitable alternative experience.

An attractive salary, enhanced by additional benefits to include Company car plan and relocation assistance, is available.

If you would like to be considered, please contact the Advising Consultants, Martin Stainthorpe or Ian Payne, on **021-236 3781** (24-hour answering service), or alternatively submit a detailed c.v. to the Birmingham office.

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ORS CIS COBOL PROGRAMMERS
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VMEB SYSTEMS PROGRAMMERS
IDMS PROGRAMMERS, ANALYST PROGRAMMERS, SYSTEMS DESIGNERS VARIOUS
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VAX CORAL 66 PROGRAMMERS
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(1981)

PROGRAMMERS: IF YOU'VE GOT THE GET UP AND GO, YOU COULD GO UP AND GET £13,000

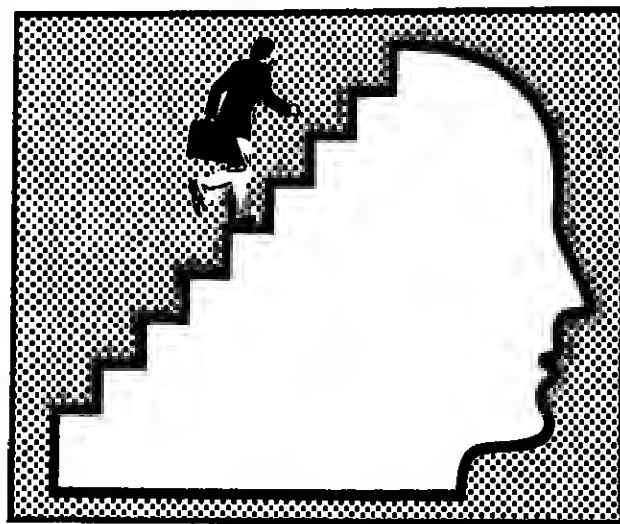
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On paper you'll need to be aged 21-31, with a degree, preferably in Computer Science or something not far off, and a pretty sound background in programming.

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Command and Control, Radar and Navigation, Simulation, Guided Weapons, Man Machine Interfaces, MASCOT, Data Base, Industrial Process Control, Data Acquisition, Instrumentation, Robotics, Telemetry, Telecommunications, Data Comms, Message Switching, Networks, Protocols, Integration, Graphics, Expert Systems, Compilers, Operating Systems, Software Tools, ADA, CHILL, UNIX.

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Requirements:

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If so, we can provide you with a route to increased rewards and job satisfaction. All you have to do is contact Alasdair Scott in London or Roger Dodd in Lichfield, quoting reference WSC/053 and we will do the rest.

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PROGRAMMER/ANALYST (£7,404 to £9,025)

An opportunity has arisen for experienced and well qualified applications development staff to join the Computer Department of Grampian Health Board.

A full range of applications, covering financial, administrative and medical aspects of the Board's activities, are currently run on two ICL 2804s, a GLE 8048 and a number of other minicomputers. In the latter half of 1983, the department will take delivery of an ICL 2966 8Mbit mainframe on which it is intended to run TP and data base (IDMS-X) applications under VME.

Applicants for the Senior Programmer/Analyst post should have at least four years' experience in computing and have held responsibility for the development/support of at least one major application. This is a permanent post.

Applicants for the Programmer/Analyst post should have at least two years' experience in programming; have an aptitude for analysis and be able to work effectively with a minimum of supervision.

Experience in one or more of the following areas is desirable: ICL/CTL hardware/software; Developing TP programs; Database (CODASYL); Richard Pike software.

For further details contact Mr. G. McIntyre, at Grampian Health Board Computing Centre, Westburn Road, Aberdeen, Tel. 02241 88118. Completed application forms should be returned to: Area Personnel Officer, Grampian Health Board, 1 Albany Place, Aberdeen by 23rd June, 1983.

UNIVERSITY OF GLASGOW COMPUTING SERVICE VACANCIES

Applications are invited for the following vacancies:

OPERATIONS MANAGER

Ref. No. 4899P

The person appointed will be expected to take charge of the operations division of the computing service and will be responsible for the day-to-day operation of the central ICL 2978 computer (due to be replaced by a model 2988 system in August) together with all the related communications equipment, satellite systems, and associated services.

Salary will be on Grade II (£11,160-£14,125) or Grade III (£13,515-£15,925) of the scale for other related staff, with placement according to age, qualifications and experience.

PROGRAMMERS (3 posts)

Ref. No. 5100P

The successful applicants will work in the fields of Microcomputers, Communications and Software Support. Salary will be on Grade IA (£7,180-£11,615) of the scale for other related staff, with placement according to age, qualifications and experience.

Applicants for the above posts should be in possession of an Honours Degree (or equivalent).

Further particulars may be obtained from the secretary of the University Court (Room 18), University of Glasgow, Glasgow G12 8QQ, with whom applications (8 copies), giving the names and addresses of not more than three referees, should be lodged on or before June 30, 1983.

SALES BIT

Quality of Management — 55

How you pay, not the sum that matters

A WIDE variety of methods for calculating the remuneration of sales people generally fall into four categories: Salary only; many industries adopt this approach, particularly those whose product is primarily sold by means of merchandising and advertising (the salesman has minimal influence upon the ultimate sale). Few companies in the computer industry adopt this method, although one of the leading minicomputer manufacturers has always paid salary only and is convinced it is the most sensible way of rewarding and retaining the kind of salespeople it wishes to employ. I am yet to be convinced that salespeople achieve as much and set any more conscientiously when their performance is not income-related.

Substantial salary plus small bonus: many industrial salespeople are paid on this basis. The typical structure consists of what might be termed as "a living wage", plus a small additional payment, which usually depends on one event, like reaching individual sales target or the company achieving its profit objectives. If the incentive is small, so is the resultant influence on the salespeople concerned. Few, if any, computer companies utilise this method of payment, and rightly so in my opinion.

Equal salary/commission: this is the most popular form of payment in the computer industry. Most companies pay a basic salary, which represents between 40% and 60% of on-target earnings. The basic salary is intended to be less than living wage and implies that the salesperson must sell something if he is to survive. Commission-only: this method of payment is usually reserved for agents or distributors with an exclusive geographical franchise. Sometimes salespeople operate ostensibly as employees, but are paid by commission exclusively. They may have the use of a company car and the firm may even provide them with office space, but in reality they are freelancers who are more likely to be fixed on Schedule B than Schedule A. This is the big league, the domain of those who have sufficient confidence in their selling ability to stake everything on their own ability to succeed. And when they do, they tend to earn much more than those with the security of assured earnings. That's only reasonable.

There is no real evidence to show whether salespeople perform differently according to what they are paid. But in most avenues of life, one expects to get what one pays for. So I can see no reason why the rules should be any different to the case of salespeople. On the other hand, experience suggests that salespeople do react to the way they are paid as opposed to the amount. So it is important to ensure that the construction of a remuneration package is geared to achieving the individual and cumulative objectives of company, product, territory, and salesmen. This cannot be accomplished by inflicting upon the salesforce an arbitrary, stereotype mechanism based on historical precedent and what the competition appears to be paying at present.

Certainly the components of sales rewards are limited: salary, commission, bonus. One could say there are only two elements: fixed and variable; but I prefer to describe lump sum payment, or those made as a result of company or other performance outside the individual salesman's control, as bonus as opposed to the directly geared effect of commission. As for getting what you pay for — or more accurately, how you pay — one must bear in mind the kind of person likely to be attracted by what is on offer. What kind of person is a salary-only salesman likely to be? A team man who accepts the order, rather than makes the sale? A merchandiser who depends on heavy promotional investment? A consistent and average performer, rather than a high flier? A company man with management aspirations? A steady, long-term employee? One who welcomes supervision and expects regular training and management support, sometimes even assistance in selling? One who does not welcome prospecting or hard closing? One who feels no motivation to make that extra call at 5.30 pm on a rainy evening in Rotherham? One who can subsist to comfortable apathy of "It's Wednesday, so it must be Wolverhampton"? One who lacks total confidence in his own ability?

On the other hand, is the commission-only salesman any more attractive? An aggressive lone wolf who leaves a trail of disruption? An erratic performer whose typically high performance cannot be relied upon? An independent, insular, even arrogant individual who hates supervision and training? One who concentrates on revenue, rather than profitability; quantity, rather than quality; oversells, rather than under-sells? One who has no real ambitions to become a manager?

Alan Williams

PUZZLE ANSWER

3 2 3 8 5 5 0
3 2 3 8 5 5 0
3 7 9 8 4
6 5 1 5 0 8 4